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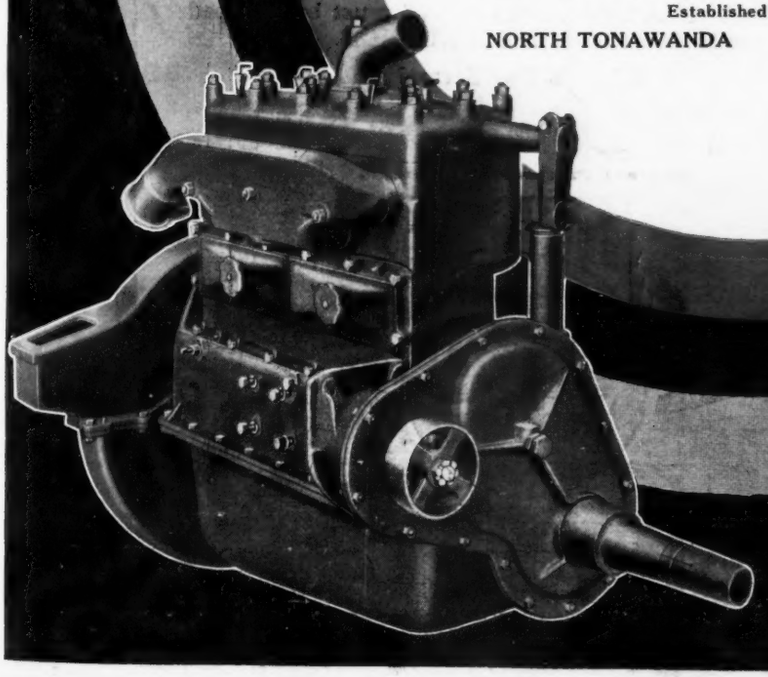

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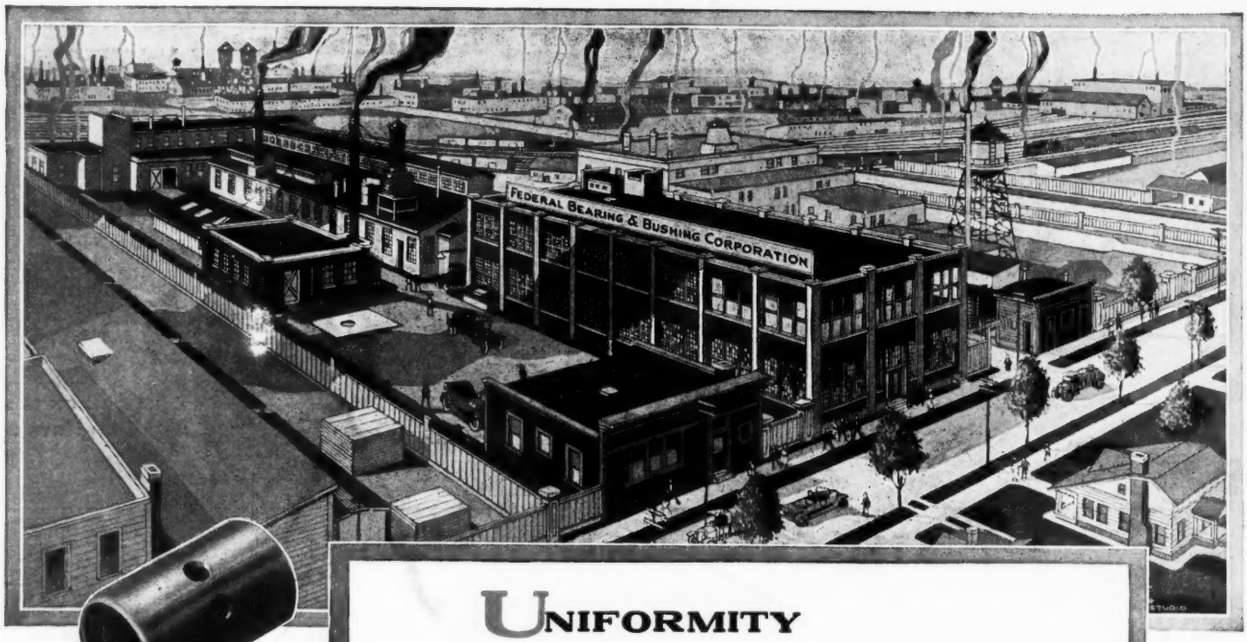

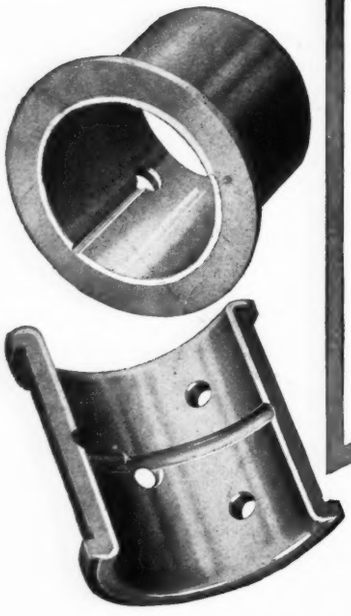

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLIII NEW YORK—THURSDAY, OCTOBER 28, 1920 No. 18

N. I. V. A. Looks to Future of Power Farming

The twenty-seventh annual convention is devoted to future of the big idea of finance and education necessary to properly present the tractor, truck and accompanying equipment to farmers and bankers.

By Clyde Jennings

WHATEVER one may think or say of the National Implement and Vehicle Association, after sitting through the three-day convention at Atlantic City last week, he must be convinced that this association takes itself seriously and is not to be diverted from the work in hand by topics of the day.

This meeting was planned as a climax of the year's program of "Co-ordination of Co-operation." This big idea behind this rather vague sounding platform was the lining up of all educative and helpful influences for the promotion of the improved farming machinery. This includes the education of the farmer, the dealer and (to an extent) the manufacturer. The means of accomplishing this, as the Association sees them, are:

(1) The proper sort of publications by the Government bureaus, the right spirit in the farm and implement papers and a general widespread effort to convince the great public of the newer day in farming and of its importance.

(2) The putting of agriculture on a firm business basis through a more definite appreciation of its importance to the business of the nation and the world. This is to be accomplished by the establishment of better means of credit, transportation (especially reasonable highways and waterways) and suitable education.

(3) The elimination of the "welfare" idea as directed toward the farming industry. It was a prominent thought all of the time that the farmer does not want charity any more than the factory worker, nor does he want any missionary spirit directed toward him. He merely wants a reasonable opportunity to make a living that will permit him to live like the business man in the city, who has an equal investment in business. He wants an opportunity to finance his schools, his highways, to buy the essentials for good living for his home and his farm. He wants to do this in a business way according to the regular order of things, but he cannot do them on a business system that is based entirely on a mercantile business that has a stock turnover of three or more times a year. Except in an emergency, a ninety-day note is useless to the farmer, however handy it may be to the storekeeper.

The culmination of this idea was well expressed by F. R. Todd of Deere & Co., who spoke on the subject, "Farm Operating Equipment and Its Relation to Agriculture." The speaker traced the history of implement improvement from the hand tool days to

the power farming equipment and made the statement that this year's crops in the United States, with the 1840 equipment, would mean 570,000,000 days' labor but with modern equipment it means only 119,500,000 days. This accomplishment, he said, must be carried on and, to quote him freely:

> It is our task to continue to maintain production of food per person of population despite the trend of the country boy to the city. It is our duty to raise the standard of this equipment so that our farmers may continue to send the strong, virile manhood to the cities to make automobiles, talking machines, pianos, lighting plants and other things which make life on the farm worth living. We must not permit a plea to go forth to stop the manufacture of these things which mean so much to the standards of living for the mere production of food.

Of course there were two topics that were on the mind of every man present. These were:

(1) The prospect of immediate sales.

(2) The recent report of the Federal Trade Commission.

But as great as was the interest in these two topics, they were not permitted to interrupt the program which was looking forward beyond the period that will be affected by them. It was the great future that was on the minds of those who had arranged this meeting.

(1) The sales program for the next few months was discussed publicly not at all. Privately there was much discussion. There was no denial that the immediate season looked bad. It was also the private opinion that prices on tractors and other power farming equipment could not be immediately cut, because the parts had been purchased and paid for. It was admitted that if prices were not cut, that sales resistance would be greatly increased. The dealers and field men present said so. The manufacturer appeared to be more willing to write off his loss on the increased sales resistance than by cutting the price of his output and writing off the loss on his inventory. There seemed to be the idea that things are never quite as bad as they look in pessimistic moments and that perhaps the trade, after all, would take most of the output. There may be lower prices soon, and there may not be. There was no indication as to how the manufacturer is going to view this question when he gets home and thinks it over after the contact of this meeting.

(2) The Federal Trade Commission was only alluded to incidentally until the last number on the set program. Then Burton F. Peek of Deere & Co., took up the subject under the program assignment of "Report of the Federal Trade Commission's Investigation into the 'Causes of High Prices of Farm Implements.'" In his introduction Mr. Peek moved to amend the title of the report to "Much Ado About Nothing."

The only defense entered by the speaker was a comparison of the briefed public statement made of the investigation with the actual report, which constitutes a book of 700 pages. He said that the publicity statement actually condemned the industry as profiteers and that this evil report had been spread abroad and printed in all newspapers. His recommendation was that the truth could never hope to overtake this scandal, so the less said publicly the better. The only thing to do was to live down the evil reputation.

But his analysis of the entire report was exceedingly interesting. The basis of it was that the cost accounting system fostered by the Association for the education of its members was of the form and style that had once been approved by the Federal Trade Commission and that reports on this work always had been on file with the commission. But a more interesting item was the analysis of the reported profits. He stated that in the report it was clearly set forth that all profits quoted were on operating income and in these the patents, good will, property taken for debt, property taken for future and Liberty Bonds and similar investments were not considered at all. Neither were Federal taxes, such as income and excess profits. It was shown in the report, he said, that according to operating profits, the income of the several plants under inquiry had increased from 9.7 per cent to 19.9 per cent. But when these were subjected to the other tests to indicate what actually was profit from the standpoint of the stockholder, the average profit for the six years from 1913 to 1918 was 6.51 per cent and that the lowest profit was 4.07 per cent in 1916 and the highest was 9.86 per cent in 1918. A real profit of 7.71 per cent was the record of 1913. The actual report, he said, set forth that the prices affecting the farmers increased, during the war period, as follows:

Implements purchased, 73 per cent.
Other Purchases, 98 per cent.
Products, sale, 112 per cent.

This table, the speaker thought, would convince any person taking the broad-minded view of the situation, that the implement makers were not profiteers nor were they working any hardship on any one.

Mr. Peek's view of the situation made an excellent impression on his audience and was quite warmly approved of. Especially was he commended for his spirit of moderation in keeping his entire treatment of the subject to the documents included in the general report and in avoiding any reference to other industries. He made no effort whatever to blacken any other line of trade nor to hide behind any other skirts. In the end, his condemnation was that the report had been given unfair publicity when judged by the entire document. His service had been that of reading and analyzing the report for those who had not the time, nor the opportunity to do so for themselves.

There was a surprising number of points of contact brought out in the entire program. The Association had invited to appear before them a representative of the implement dealers, the farmers, bankers and representatives of Government bureaus with which they work.

The most entertaining talk on the program was that by George W. Collins of Belleville, Kan., representing the National Federation of Implement and Vehicle Dealers, who reviewed humorously the dealer from the day of the cross road blacksmith shop dealer to to-day, when power farming and service was the idea in all minds. Mr. Collins said frankly that only a small proportion of the dealers had risen to the new idea but he thought that more and more of them were getting it and with the encouragement of the manufacturer, the number would increase. He regarded this as "the Easter day of the new dealer." He asked for patience and a square deal.

The speaker who created the most interest was J. R. Howard, an Iowa farmer who is president of the American Farm Bureau Federation. Mr. Howard strongly favored greater standardization, a sentiment which was strongly reflected throughout the entire convention. He said that because he broke a small spring on his ensilage cutter his corn was not put into his silos until a week after a killing frost. His view was that such things as small springs should be standardized so that he could have bought the spring at any farm supply store.

He asked for unbiased information on the tractor. He was told that efforts were being made to bring this about

through Government and State experimental bureaus.

He asked for better highways from the farmer's gate to his market and less of the spectacular National Highway building. He did not object to a few of these highways as examples, but he wanted larger support for the broad, everyday highway plan.

He entered a very strong plea for the manufacturers to support inland waterways and water power movements. He said that the farmers of the Middle West believed that a waterway connecting the Great Lakes with the ocean would mean as much as 10 cents a bushel saving on grains and that the development of water power in such favored locations of New England would mean a solution of the ever vexing coal and transportation problems of the farmers in the Mississippi valley.

He served notice on the manufacturers that there must be a better system of bank credits and of marketing farm products. **There was now too much waste between the producer and the consumer.** The co-operative marketing was coming and it must be made effective with the help of legislation. Also the credit system must be revised from that of the quick stock turnover to a once-a-year turnover. Last year he was forced to buy a lighting plant and the labor saving household equipment, or permit much of his land to lie idle because he could not hire household help. But to do that, he was forced to renew a 90-day note three times, because there was no long term borrowing system within reach.

He finally told the manufacturers that he had noted many of their names among the supporters of the Industrial Conference Board which had recently recommended as a means of Federal revenue an excise per acre tax on farms worth more than $10,000. He said that such a tax would be a death blow to successful farming. The fact that such a recommendation had been made was startling to many of the manufacturers who are supporting this board and they promised instant attention.

Square Deal Labor Policy

Walter Drew of the National Erectors' Association, spoke on the labor situation. His view proved to be exceedingly popular with all present. He reviewed the good works accomplished by unions and the very excellent field that was open to an organization such as the unions could be, then he contrasted the present accomplishment. The closed shop he utterly condemned because of the abuse of it by unwise leadership. **He said that the solution of the labor problem was in the co-operative spirit of the manufacturer. The employer must carry to his workers the idea that the factory is merely the selling agency for such talent as the worker has to capitalize.** This can only be done, he said, by removing from the heart of the laboring man the fear of unemployment, which is the motive behind the idea of less production will insure a job. The employer must get on a **man to man basis with the men who work for him.** The average worker is still the mechanic who once made and sold the complete article. He was then his own employer and sales manager. To-day he must be brought to realize the importance he has in the ultimate product of the factory, his own importance and the view of the market.

The worker, Drew said, is a hard man to fight but he is not a hard man to co-operate with. **He left the inference that it would be a wise thing for employers to remember their own days in the shop.**

There were three bankers on the program, each of whom brought a distinctive message. Willis H. Booth of the Guaranty Trust Co., New York, stopped on the way home from the bankers' meeting in Washington to make his address, and because of the happenings there he scrapped the speech he had prepared and talked on the plans formed at the meeting of the bankers to finance export. This, in brief, was the formation, under the Edge law, of a $100,000,000 finance company that by the use of debentures, could do a total business of $1,100,000,000 in foreign countries. The object was to promote the sales to the low exchange countries of Europe. This company could loan money on the realty, warehouses and other real property in Prague or other cities and place the amount of the loan to the credit of the dealer in New York in dollars, so that he might buy materials or machinery in this country and pay for it after the materials had been converted into finished products. He advised members of the association to have a friendly word for this new form of security when it was offered on the market. His talk aroused much interest and brought a number of questions as to practical operation.

Joseph Hirsch of Corpus Christi, Tex., was the second banker. He talked chiefly of the Banker-Farmer movement, of which he is the promoter and which has done such a wonderful work in financing pig, calf and other clubs and he advanced some ideas for the financing of the purchase of farms and implements. He left with the manufacturers many ideas that they can pass on to their dealers and some of which they can promote themselves.

John Fletcher of the Fort Dearborn National Bank, was the banquet speaker. He had sat through the convention to get the ideas before the industry and spoke directly on the problems that he had heard discussed. His reference to the present was the most direct that was made. He said that it was no secret that buying was at a low ebb at present and might be for some days to come, but surely there was a brighter and better day coming. He reviewed the steps taken to improve and increase agriculture and he approved of them as steps to aid the basic industry of this country. His greatest criticism of the average manufacturer of to-day was that **"he has spent thousands of dollars to sell his product to the public, but not a nickel to sell himself and his product to his labor."** He asked a return to the simpler forms of doing business, to a more direct contact throughout the factory and to an intimate relation between the factory, the dealer and the consumer so that each might know the other's needs and be sympathetic of them.

Standardization Gains

Not the least of the activities of the convention was the interest shown in standardization. The topic was presented in a formal way by Prof. J. B. Davidson of Iowa State College. His address was chiefly a plea for standardization. He made the direct point that those of his pupils who had been engaged in export fields had told him that the chief fear of foreign customers was that they could not get repairs. He told of the good that had been accomplished in wagon standards and reminded that most lighting plants were made according to standards adopted by the Society of Agricultural Engineers. His chief plea was for standards of rating for tractors, ensilage cutters and other power machinery and for belt speeds on tractors.

All through the convention this topic kept coming to the surface, and the references showed that it was gaining strength. One of the resolutions adopted was an outspoken declaration for greater standardization and for the elimination of little used types of implements. One important standard that appears to be making definite headway is the width of rows for intertilled crops.

This story of the convention is not, of course, going to reflect the many undercurrents nor tell you all that

happened there. That is not the object. It would be unfair to those who attended to let the stay-at-homes get the full benefit of the convention by merely reading a few pages. What we are trying to put across is an idea that this gathering represented an all-American group of business men who are not letting a bit of present-day pessimism dampen their view of the future.

These are the men, more than any other group, who must put the tractor on the farm. They have a big idea of their job. Also they are coming more and more strongly into the truck business and they have the farmer chiefly in view as their customer. The implements that they made for years are being scrapped in favor of larger and better implements. All of this means within a comparatively few years a complete change in their business. It means a greater item of sale and a complete re-education of their customers. Both of these things the members of the Association are undertaking in a big way. They devoted almost all of their convention time to this phase of their problem, ignoring the details which might be considered of greater immediate interest. This story may omit a number of the details.

As an instance of this idea of the presentation, W. H. Stackhouse, the new president, was the speaker on "Transportation." He reviewed the situation briefly and generally, but gave much attention to the future operation of the railroads under the recent transportation act. He praised this act as a great legislative work and told how the members of the Association would find contact with the Labor Board created under it, and under the newer powers of the Interstate Commerce Commission. He looked forward to better transportation, if business men did their share.

And this reminds that all through this convention, from President Wallis' excellent review, to the last word at the banquet, there was a constant and strong urge that business men must show a greater interest in government of all degrees, from the township up, if business is to have a satisfactory contact with government. Only business men can make a business government, which is the crying need of the day. If business does not do this, then they have no right to kick. This did not appear as party stuff, but all time doctrine.

Then there was V. V. Gregory, editor of the Prairie Farmer, who predicted $3 wheat next May, but found his audience skeptical. But he did find them with him on his presentation of the co-operative marketing schemes. And, by the way, there was a very general opinion that power farming equipment was not a thing to go into co-operative buying establishments, but that dealers had better ally themselves with such organizations. It was a conclusion that co-operative buying establishments are unable to give the service required. And service is a very big thing, so said all of those present. That is why some manufacturers are still in doubt as to what extent the automobile dealer is going to eventually market this line. **With some makers it appears to be a toss up as to whether the automobile dealer will get the sales idea, or the implement dealer the service idea first.**

There was a social side, of course. A gypsy picnic in the Traymore American dining room, a dance another night and finally a banquet.

When W. H. Stackhouse was promoted to the presidency, William Black was elected chairman of the executive committee and H. J. Sameit was re-elected secretary.

New Carbureters for Different Fuels

THE motor fuel problem, which now confronts nearly the whole world, was particularly acute in Germany during the war. Previous to the war gasoline (known in Germany as benzin) had been the common fuel for automobiles, but shipments from overseas being cut off, it soon became unavailable. From gasoline the Germans went to benzol, then to petroleum mixtures, turpentine-substitutes, benzol-alcohol mixtures, alcohol, Electrol, wood alcohol, Benedixine, light Melanol; tar oil, gas oil and Solar oil to "stretch" the supply of benzol; shale oil, heavy Melanol.

Electrol, a war-time fuel, is a somewhat variable mixture of wood alcohol preliminary run with alcohol and contains also some benzol and sulphuric ether. It gave generally good results. Some grades of Electrol contained naphthalene, but these were less satisfactory, as the naphthalene separates out easily and clogs the nozzle.

Benedixine is another war fuel which is said to consist of gas oil, kerosene, heavy gasoline, Solar oil, solvent naphtha, and benzol, and is characterized by a strong sulphuric ether smell. This fuel gave very good results.

What is referred to as slate oil in Germany has been regarded as identical with the shale oil of Scotland and Colorado, but this supposition is said to be erroneous. The raw material from which this liquid fuel is derived by the Messel Works is intermediate between bituminous clay and brown coal. It resembles slate because of its high ash content and brown coal on account of its high water content. The fuel from this source had a specific gravity of 0.80 and resembled gasoline more than benzol.

Melanol is a distillate of tar oil and was used in seven different grades (volatility). The lighter grades gave good results, but the heavier grades could be used only in admixture with benzol. As compared with benzol, Melanol has the advantage that it has a very low congealing temperature and does not give any trouble from congealing in winter, when benzol can be kept in the liquid state only by additions of toluol, ether, alcohol or kerosene.

C. W. Kreidel of Berlin, author of Neuere Vergaser und Hielf review, made extensive tests with all of the different fuels named, and with numerous different carbureters, which he describes. These tests were evidently made in an official capacity. The results of the tests are given in tabular form, the factors noted being carbureter details, fuel composition, fuel consumption, maximum and minimum car speeds. As the author states, many of the fuels experimented with will undoubtedly prove serviceable also in peace times and this should make the book a valuable acquisition to automobile literature.

Frieherrn Low von und zer Steinfurth, author of Neuere Vergaser und Hilfsvorrichtungen fur den Kraftwagen-Betrieb mit verschiedenen Brenustoffen (Newer Carbureters and Accessory Devices for Motor Car Operation with Different Fuels), has made extensive tests with all the fuels named and with numerous different carbureters, which he describes. The book is published by C. W. Kreidel, Berlin, and contains descriptions of tests made by the author in an official capacity.

All Labor Troubles Cannot Be Cured by the Same Remedy

Labor expert tells of the doctor who, when unable to diagnose a case, gave his patients a concoction to throw them into fits—he had a cure for fits. The article shows that the method is not applicable to industrial relations, and analyzes failure of many industrial democracy experiments.

DR. W. M. LEISERSON, Chief of the Division of Labor Administration, struck a significant point in presenting to a group of employment managers the problems of an employees' representation plant with the single plant as the unit of organization. He said in part:

"In the plans called 'employers' unions' there is not always a clear understanding of what his employees' organization involves. Where the principle of collective bargaining is present only by implication, as is true in practically all of these plans, it quite often happens that the employer does not realize that his plan involves this principle. The employees, however, usually assume that it does not mean anything unless it gives them the opportunity to bargain collectively with their employers.

"It is hardly necessary for me to point out to a group of employment managers that any misunderstanding like this of the purposes of a plan of employee representation is likely to cause trouble between employer and employee, making the employees feel that they have been deluded, while the employers are likely to think that the workers are ungrateful for all the things the management has been trying to do for them.

The Shop Committee Deluge

"In spite of the dangers of misunderstandings of this kind, a deluge of shop committees and employee representation plans is flooding the country. Employers, feeling unrest and distrust among their employees, are seizing on these plans as a sort of panacea for all their labor troubles without clearly analyzing their troubles and the nature of the remedies. Employment managers—and labor experts also, I am sorry to say—are zealously advocating representative committees as if the mere organization of these would of itself solve any labor problem. A great many of our labor difficulties are caused by poor labor management. Democratic organizations of employees will not remove these. Only good management will help in such cases. Employees' organizations are needed to deal with labor troubles that arise under the best management, that grow out of the democratic movement in industry.

"Before attempting to deal with organizations of his employees, the employer ought to have a thorough knowledge of the labor administration machinery already existing in his plant, which labor relations this machinery is designed to handle and which it is not equipped to handle. This is the diagnosis part of the job and, unfortunately, diagnosing the industrial ills in a plant is usually neglected both by employers and labor experts.

"Remedies are applied because of their supposed general healing powers, and just now shop committees seem to be the most popular of these patent medicines. You may have heard of the country doctor who, when he did not know how to diagnose a case, gave his patients a concoction to throw them into fits. And he had a good remedy for fits. We must avoid thinking that all labor troubles are just fits that can be cured by one remedy like committees.

"Personal relations presents the problem of handling human beings in industry. It means the handling of the human element that goes into production with the same understanding of the feelings, instincts and prejudices and characteristics of the workers as the management has of the materials and mechanical forces which it uses. The personal relations in industry cover such questions as hiring, selection, placement, training, promotion, treatment by foremen, health, safety, recreation, lunches, rest periods, etc.

"Economic or collective relations presents quite a different problem. It has to do with the division of the product of industry, with the government or control of industry, with bargaining, wages, hours, unionism, and shop discipline. The return that workers should get for their labor, the number of hours they shall work for what they get, the authority they shall have in fixing terms and conditions of employment, the voice they shall have in making disciplinary rules and punishing infractions of such rules—these are questions that present controversial issues which cannot be settled by any technical expert. They are matters which require democratic decisions and about which a wide diversity of opinion will be permitted in any democratic system of industry.

Significance of Representation

"It is always dangerous for an employer who wishes to maintain personal control of his business to use representative committees, which are a device of industrial democracy. The administrative machinery of such committees is designed primarily for the collective action required in dealing with the economic or governmental relations in industry. Only when he is ready to administer justice to his employees as they understand justice, only when he is ready to give them a veto power on his acts and to insure them a trial by their peers, a jury of fellow employees, should an employer inaugurate an employee-representation plan. For once he begins to deal with governmental relations in industry he must create wage-fixing committees of employees, arbitration boards, and impartial umpires. In a word, he must be prepared to give up his exclusive control over wages, hours, and shop discipline.

"Though America has an excellent remedy for Bolshevism, we can never solve our industrial relations problem by branding every symptom of industrial unrest as Bolshevism, any more than the country doctor could convert every disease into fits and successfully effect a cure without further analysis."

Tractors Perform Effectively in British Trials

Though spectators were comparatively few, excellent performances featured the 1920 British tractor trials. There were 46 entries, all except two of which were powered by internal combustion engines. New British Peterboro experimental machine attracted much engineering attention.

By M. W. Bourdon

FROM the fact that even while the 1920 British tractor trials were in progress entries were being accepted for the trials of 1921, it might be concluded that the former were an unqualified success. Yet, if the truth be admitted, there is every probability of the majority of the entrants viewing as fruitless their efforts which commenced on Sept. 28.

Last year the British tractor trials were organized by the tractor section of the Society of Motor Manufacturers and Traders. The Farmers Union appointed judges and observers, and unbiased technical advice on mechanical points was placed at their service. Early this year the Royal Agricultural Society of England let it be known to the tractor industry that it was going to run tractor trials this year, whether the tractor industry did so or not. Obviously the running of two trials successfully would have been an impossibility, and, as the R. A. S. E. would not give way, the S. M. M. T. in a weak moment offered to join forces. Graciously the "Royal Society" allowed the manufacturers' body to fall in behind their banner, but many conditions were stipulated.

Comparing the fundamental idea of the 1919 trials with that of the 1920, the former constituted widely published invitations to farmers from tractor makers to see machines working under various conditions and under the observation of the representatives of agriculture, and to hear later the considered opinions of those representatives with all available experience, facts and figures before them. The 1920 idea was an invitation to tractor makers to compete for some gold medals and $100 prizes (like plowmen of old) in the presence of a select body of judges; impossible conditions were originally laid down by an advisory "expert" of 50 years' standing (the R. A. S. E. is conservative even in the appointment of its officials), but were amended with great reluctance under the advice of the makers' society.

Those comparatively few farmers who did attend at this year's trials—which, with supplementary tests, dragged on for over a week—were favorably impressed with the organization, so far as it concerned the official observation and checking of the work done, fuel consumed, and so on. In these respects it would be difficult to criticize; but the credit is due to the S. M. M. T. rather than to the Royal Agricultural Society.

Forty-six Entrants

The trials attracted 46 entries, all except two being internal combustion engined outfits. The entrants were divided into seven classes, four of which covered all the 42 direct-traction machines with internal combustion engines, the remaining three classes having only four entrants, viz.: 1 steam tractor and 3 cable plowing sets. There were eight non-starters in the four principal tractor classes, the participants being as follows:

Class I.—Tractors up to 24 hp. plowing two 10x6 in. furrows: British Wallis,* Austin,* Cletrac (Cleveland), Case, Fordson, Garner, Samson, and Saunderson Junior.*

Class II.—Tractors up to 30 hp. plowing three 10x6 in. furrows: Parrett, Hart-Parr, British Wallis,* Austin,* Blackstone,* Peterboro,* Cletrac, Case, Chase, Twin City, Fiat, Martin,* Emerson, G. O., Pick,* Saunderson,* Moseley (Illinois), Glasgow,* and Weeks.*

Class III.—Tractors over 30 hp. plowing four 10x8 in. furrows: Berna and Lauson.

Class VII.—Self-contained plows, turning not more than four furrows not exceeding 10x8 in.: Crawley,* Fowler,* Martin,* Moline, Boon,* Santler.*

(Tractors of British manufacture are signified by an asterisk, the others all being American machines except the Fiat and Berna.)

Official observers were appointed, one to watch the behavior of each machine; the following are some of the points on which they were called upon to make records.

(1) Time taken to prepare for work.
(2) Consumption of fuel, water and oil.
(3) Duration of stops for mechanical adjustments.
(4) Attendance required by the tractor.
(5) Acreage plowed within given time.

In addition to these points the judges announced their intention of taking into consideration the following in making their awards:

Weight of machine; weight per inch width of wheel and diameter of wheel; mechanical design and construction; adaptability of handling; ease of turning and space required at headlands; efficiency of winding gear (if fitted); facility of attachment to plow; wheel devices and price.

Extremes in Weight of Land

The scenes of the trials this year were only a mile or two from those of last year. Light land plowed on the first two days was on high ground at the top of a "cliff" or hill range below which was the heavy land where the third and fourth days plowing took place. Every machine made easy work of the light land, but another story has to be told of the work in the heavy soil. In connection with Class II, for example, three fields were selected, giving furrows about 350 yards long. Each varied from the

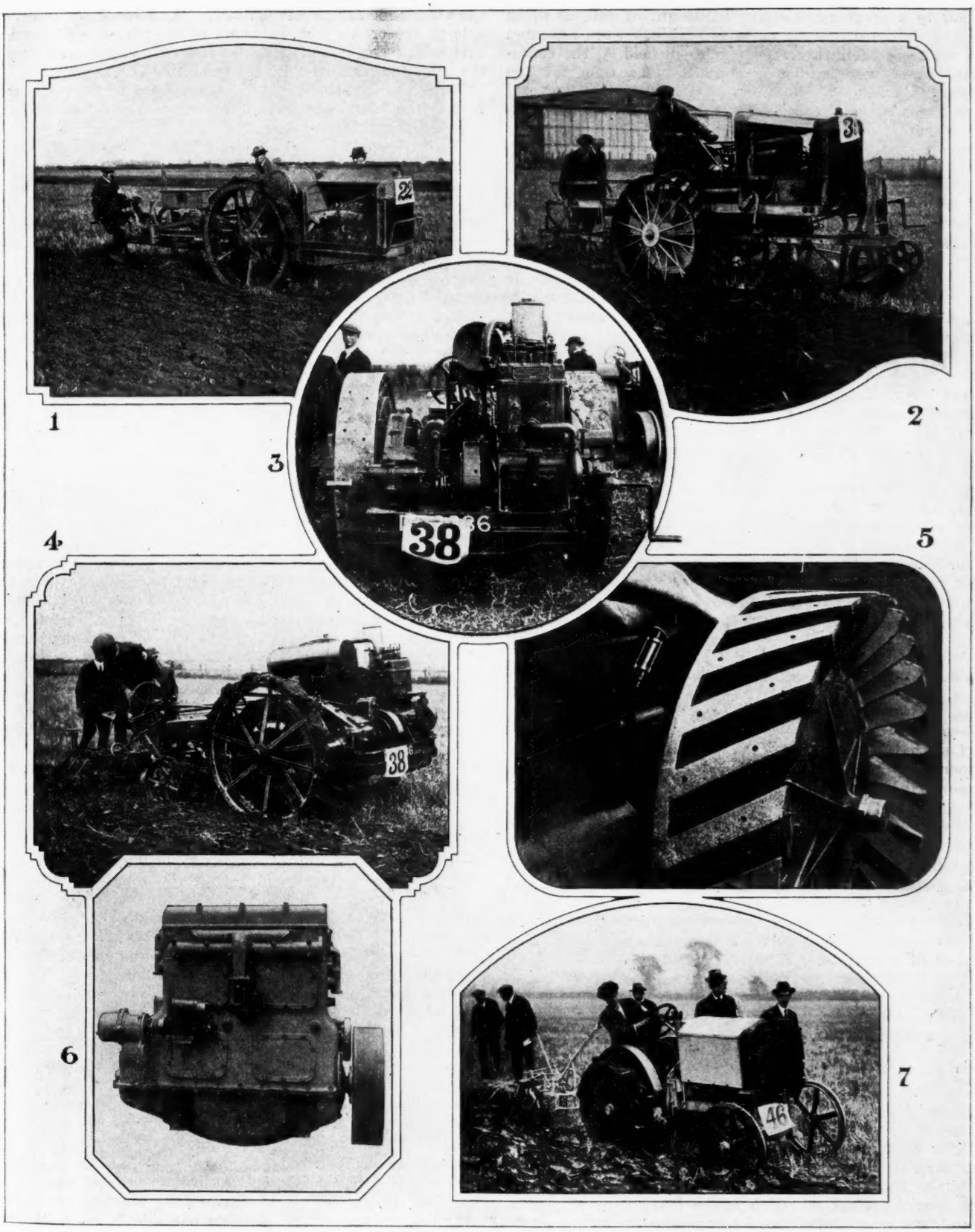


Fig. 1—Fowler motor plow; new British machine with four-cylinder 3¾ x 5¼ in. Waukesha engine. Had troublous times in heavy land with two furrows 10 x 8½. Fig. 2—The Santler one-way machine has two-furrow plow at each end. Made very poor showing and did not plow in heavy land. Fig. 3—Front view of Boon motor plow, showing overhead value, two-cylinder 5¼ x 7 in. engine. Fig. 4—Boon three-furrow motor plow engine has two cylinders, 5¼ x 7 in. Fig. 5—Rear view of the Pick wheel; strakes not in position. Fig. 6—Ricardo trunk piston engine of Peterboro tractor. Fig. 7—Small machine with big engine; the Weeks, which did well throughout, has 4¼ x 5¾ in. engine, wheelbase only 66 in., weighs 3700 lb.

other to a pronounced extent in weight of soil, so much so that while originally certain machines were allocated to work out their three acres or so in field A, the conditions there were so much more arduous than for the tractors in fields B and C, that at half time a "general post" was decided upon, so as to cause all the machines to operate under both comparatively easy and extremely difficult conditions.

In the class just mentioned the Austin and Cletrac failed to draw three breasts in field A, the chain tracks of the last named slipping excessively on the unplowed land while the engine raced away merrily. The Austin could only make progress in successive jumps by the driver slipping the clutch.

The dynamometer tests carried out with each machine in this field showed drawbar pulls varying from 2800 lb. to 3300 lb. and the three 10x6 furrows and the Parrett tractor had the worst patch of all.

One of the amended conditions of the trial caused the withdrawal of the International team. Originally, entrants were to be allowed to use any plow they wished, but subsequently they were notified that plows would be provided by the organizers in order that every tractor in a class should work under identical conditions in this respect. The International Company protested ineffectually and then withdrew their entries, refusing to accept the official explanation of the varied condition, viz.: that this was to be a trial of tractors and not one of plows.

No variation of plow bottoms was made when the heavy land plowing followed that in the light land, and, as a result, the standard depth could not be maintained in some cases, the plows lifting from 6 to 4½ and even 3½ in. The plow makers' men were responsible for the settings throughout the trials.

With one or two exceptions the tractors behaved exceedingly well, so far as the absence of mechanical troubles was concerned, and a great opportunity was lost to their makers and agents in the paucity of spectators for the reason mentioned.

Lack of sufficient power accounted for poor showing in some cases in the heavy land, but this was a failing which none of the American machines exhibited. The Fordson, it will be observed, was not entered in the 3 furrow class and the Austin people would have been well advised if they had similarly curbed their aspirations; while the latter machine carried on in the lighter of the heavy land without difficulty, if a tendency to overheat be ignored, it was quite evident that it is too much to ask a 3¾x5 in. engine to deal with more than 2 furrows—in fact, on one patch of heavy soil even 2 furrows brought the Austin to a standstill momentarily on bottom gear.

The weather during the trials was distinctly favorable and the land was in ideal condition for plowing; but for these good conditions there would probably have been a greater weeding out of the under-powered machines.

New British Machines

Of new tractors, and innovations in detail design, the British Peterboro machine stood out prominently. This is made by an old established general engineering firm (Peter Brotherhood, Ltd., of Peterborough, England) and although an experimental machine, it operated with marked success. It has a four-cylinder 4¾x5½ in. Ricardo engine, the special feature of which is the trunk type of piston. The trunk extension of the latter passes through a guide at the lower end. Not only does this arrangement eliminate side thrust on the cylinder walls, but in using kerosene as fuel it prevents any unvaporized elements of the latter from reaching and contaminating the lubricating oil in the crankcase. The piston skirt at the bottom of its travel passes down into an annular space through which the air for the carbureter is drawn. As a result the underside of the crown and the trunk of the piston are cooled, fuel which has leaked past the rings is drawn back into the carbureter and the air for the latter is warmed.

While the Peterboro engine is not distinctly novel (for it is a modification of the successful trunk pistoned tank engines designed by Ricardo), the type has not been applied to commercial purposes hitherto; but it will probably not be peculiar even in this respect much longer.

Another special feature of the Peterboro engine is the vaporizing system. As just mentioned, the air is given a preliminary heating in passing through the spaces between the pistons and the trunk guides. The induction and exhaust manifolds are cast as a unit which still further assists vaporization. Then, a by-pass from the exhaust manifold leads, by way of a duct, to two holes drilled at right angles through the choke tube of the Zenith carbureter, which arrangement enables a proportion of the products of combustion to be introduced into the new charge. The area of the exhaust by-pass is controlled by an auxiliary throttle, alongside the main throttle and mounted on the same spindle. It is claimed that this system eliminates pre-ignition with kerosene as fuel, increasing the carbon element of the mixture and providing a gas which burns slower than kerosene vapor only.

Beyond the engine, the Peterboro presents no striking features, though as an engineering job, the transmission and other details created a good impression. It weighs 4800 lb.; the frame is of rolled steel upon which the engine and transmission are separately mounted. Ackerman type steering is used with the front axle mounted on a central trunnion bearing. The final drive is through worm gearing to a countershaft over the back axle and by thoroughly enclosed bull gear to the wheels, the dimensions of which are 54x10 in.

Wheel Design of the Pick

Another entirely new British machine which did not, however, survive the trials, was the Pick. The design of this is quite different from the Pick tractor which failed last year, but again it was an experimental machine. Apart from the engine with overhead valves and camshaft, and simple splash lubrication with oil feed by two hand pumps, the interest attaching to the Pick centers in the back wheels. These are of a cast disk type (actually of bronze in the machine at Lincoln!), dished inwardly at the center, with the tread formed by diagonal webbed extensions from the disk; a space of 2 in. occurs between each of the extensions. The idea, obviously, is to prevent caking of the soil between the strakes, which are bolted to the units of the wheel tread, the soil being cleared automatically as the wheel presses upon the land.

While the favorable conditions at Lincoln did not give this wheel design a good chance of demonstrating its merits—ordinary straked wheels were giving no trouble—the principle appears to have distinct possibilities, and with modifications which may be suggested by further experiences may well overcome the wheel slip difficulty in heavy going and wet land.

The British Wallis

A tractor which stood out prominently in doing good work was the British Wallis, which is made in England to American Wallis design, by Ruston and Hornsby of Lincoln, the makers of the touring car which bears their name. In one respect the original design is departed from, for a British make of kerosene vaporizer is used, the Halliday. This device has two float chambers, one for gasoline and kerosene and the other for water. The latter —like the fuel—issues from the float chamber through an orifice adjusted by a screw down needle valve and is

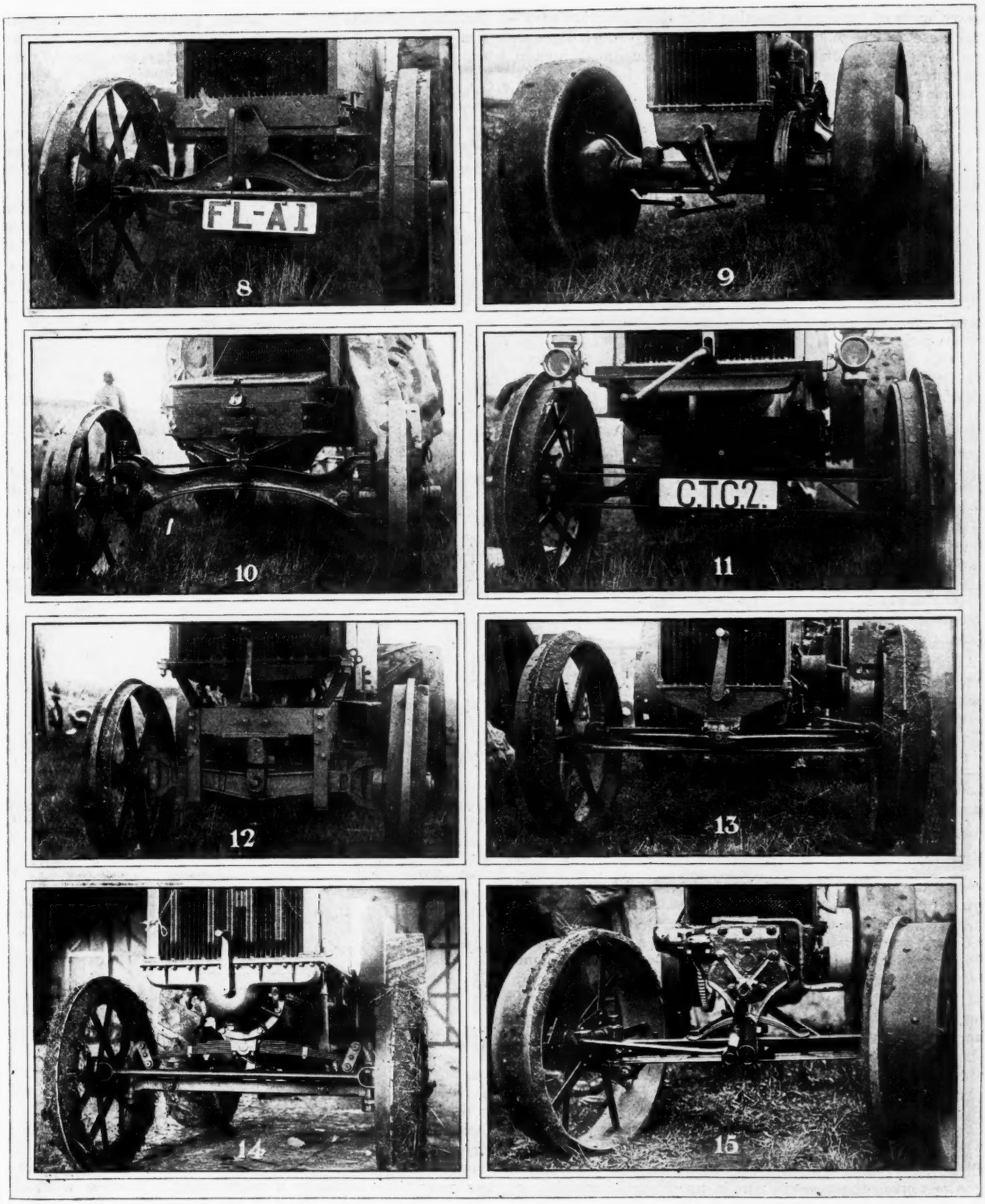


Fig. 8—Peterboro. Unsprung and centrally prostled axle with round section radius rod. Fig. 9—Glasgow. Central pivot; angle of axle relative to frame adjustable by left and right hand treaded coupling sleeve. Drive and steers both front wheels. No differential ratchet and pawl instead in each wheel. Unsprung. Fig. 10—Saunderson. Central pivot. Helical spring above swivel axle boss. Fig. 11—Martin. Built-up axle, transverse spring; duplicated coupling bars; angle steel radius members. Fig. 12—Weeks Simplex. Unsprung central pivot, axle in guide and bars. Fig. 13—Austin. Unsprung with truss front. Fig. 14—Fiat. Transverse spring; Ackerman steering. Fig. 15—British Wallis. Short transverse spring. Steering gear by bevels from wheel shaft to worm shaft in center below radiator.

drawn upward by engine suction into the induction manifold close to the valve ports. The actual vaporizing system presents no distinct novelty, being exhaust heated, the water feed being the feature of distinction.

Other new machines were principally in the self-propelled plow class, in which the Fowler and Boon (both British) were seen for the first time. The former appeared to be underpowered even with a two-furrow plow in the heavy land, the engine dimensions being 3¾x5¼ in. The machine is of the balanced type with two 54x8 in. wheels driven from a countershaft by enclosed spur gearing.

The Boon plow, made by Ransome, Sims & Jeffries, the agricultural engineers, is also a new design, though one would hardly think so, on account of its slow running two-cylinder (5¼x7 in.) engine. The latter has overhead valves, operated by push-rods and rockers, and is arranged transversely at the front of the rolled steel frame, on the left side. On the right is the two-speed gear-set, whence the drive is taken by enclosed spur gearing to a countershaft and thence by bull gears on the wheels. Rated at 20 hp., this tractor, while doing good work, is clearly underpowered at a weight of 5500 lb. It had difficulty in handling three 11x8 in. furrows and kept going, though very slowly.

The Glasgow, as will be seen from the entry list, was again in evidence with its three wheels, all driving. This machine, which created something in the nature of a sensation at last year's trials, is not yet in full production, the output having reached but nine to ten per week. But it is being very energetically handled on the sales side and the design having proved satisfactory—no modifications of note have been made since its introduction—it is likely to be a serious competitor to machines in its class.

Although at present fitted with a poppet valve engine of American make with four 4⅛x5¼ in. cylinders, it is an open secret that the real production model Glasgow will have the Argyll-Burt single sleeve engine, the patent rights of which have been secured by the firm responsible for this tractor. It behaved well and showed a fuel consumption of 2¾ gallons of kerosene per acre in the light land with a three furrow 10x6 in. plow. In the heaviest land it kept going, though the engine was inclined to overheat.

Climbing an 85 Per Cent Gradient

An unpremeditated "stunt" was performed by the designer of the Glasgow, who on a spare machine suddenly conceived the idea of climbing and descending a bank of soft earth some 30-40 ft. high, formerly used in connection with a rifle range. The sides of this bank have a gradient of approximately 85 per cent, and the tractor twice climbed and descended this without difficulty—a good demonstration of the tractive efficiency of the three-wheel drive. The climbs were made without a plow, of course.

In regard to mechanical features generally, the most pronounced tendency shown at the trials is the fitting of more efficient brakes. Some British machines are provided with expanding shoes in wheel drums in addition to one applying to the constantly rotating belt pulley. Then, there is evidence of better means of enclosing the bull or spur wheels when these form the final drive; in some examples these gears run in an oil bath, completely protected from mud and dust. More inclination by British makers is shown toward fitting an air cleaner as standard, some 50 per cent having adopted this device as against 15 per cent last year.

Kerosene vaporizers still show room for improvement in most cases, though advance is evident from 1919. Two directions in which improvement has occurred have already been mentioned, but neither the Peterboro or the Halliday systems can be termed perfect. Variations in fuel quality, the presence of impurities and other outside factors probably account for the Peterboro, the Wallis and one or two other machines failing to show a clean exhaust at odd moments.

There is still a lack of appreciation of the advisability of protecting the ignition details. Exposed magnetos, high tension wires and spark plugs were in evidence as frequently as not, with obvious risk of trouble in wet weather.

Thermo-siphon water circulation is used in the cases of Austin and Saunderson. All the British machines have pumps. Impulse starters to the magnetos were fitted to only three British machines. No difficulty in starting on gasoline was noticed, however, without this supplementary device; in fact, the only observed trouble in this respect occurred with an engine having an impulse starter.

The general tendency is to fit only two forward gear ratios and this number appears to be ample unless a tractor is designed for road work as well as plowing and cultivating; practically all machines plowed both light and heavy land in bottom gear.

Ninety per cent of the machines at Lincoln had unsprung rear axles and 75 per cent were unsprung back and front. Even British makers appear to be dropping the idea of making general purpose machines, as the law of England specifies sprung axles on all vehicles used for road traction. The road haulage test included in the Lincoln program was, therefore, rather redundant.

Although no official records will be issued until the judges' report is published, one gained an idea that some very good showings were made in fuel consumption. Among the figures elicited unofficially the following were noted:

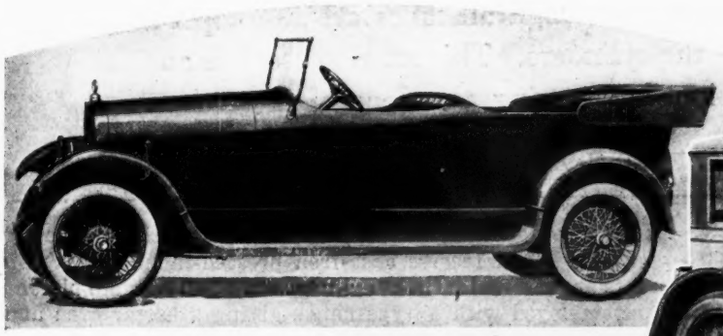
British Wallis	2.36	Imperial gals. per acre (light land).
	2.7	Imperial gals. per acre (heavy land).
Peterboro	2.6	Imperial gals. per acre (light land).
Fordson	2.6	Imperial gals. per acre (light land).
	2.7	Imperial gals. per acre (medium land).
Glasgow	2.75	Imperial gals. per acre (light land).
	2.9	Imperial gals. per acre (medium land).
Fiat	2.2	Imperial gals. per acre (light land).

A comparison made between the plowing speeds of the Austin and Fordson may be of interest. Both machines appeared to be running "all out" on bottom gear, and times were taken in both directions on known lengths of furrow (330 yards each way). The speed of the 3¾x5 in. Austin worked out at 3.4 m.p.h. and that of the 4x5 in. Fordson at 3.9 m.p.h. In both cases the speeds occurred in light land with a two-furrow 10x6 in. plow.

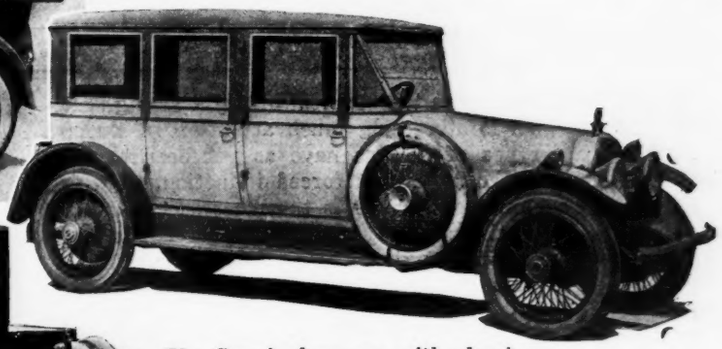
Cores for Light Steel Castings

WRITING on practice in light steel castings foundries in England, R. J. Dunderdale says that core-making has now become almost the most important part of molding where a reasonable amount of repetition work is done, as so many castings, even when reasonably designed, require a certain number of external as well as internal cores. This point can easily be brought home to users of this type of casting by mentioning that the average rear axle housing, a fairly simple looking casting when complete, takes from 10 to 18 cores in its make-up, the number required usually being near the higher figure. The amount of labor and skill required in a case like this at once becomes apparent when it is remembered that only a comparatively few minutes are required to make the cope and drag complete on a molding machine, and, of course, if the machine is not to stand idle, all these cores have to be made in approximately the same time.

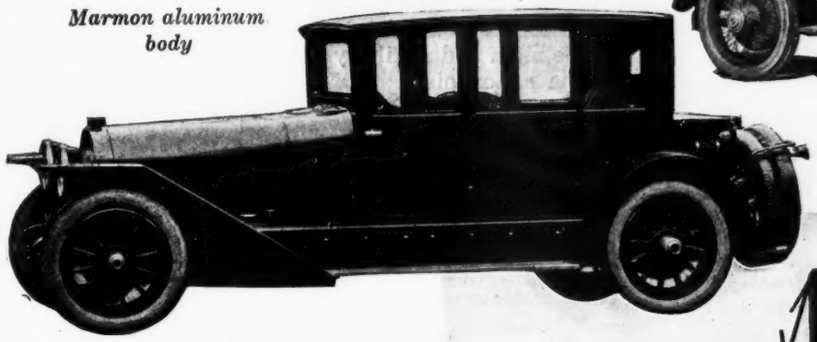
A Study in Aluminum Automobile Bodies of Recent Design



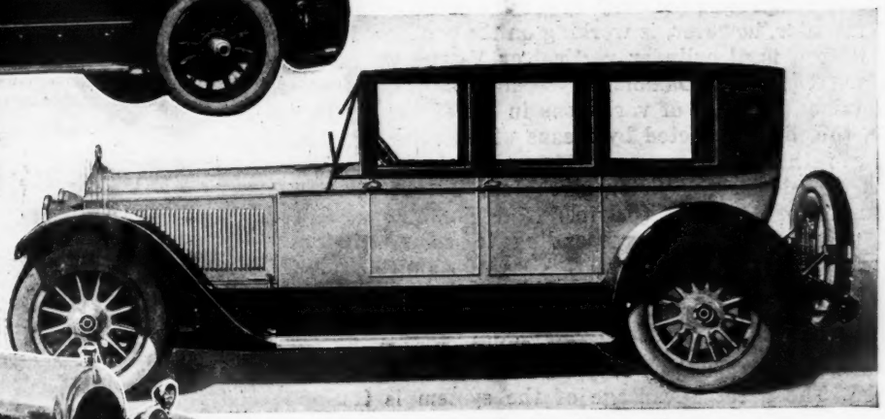
Marmon aluminum body



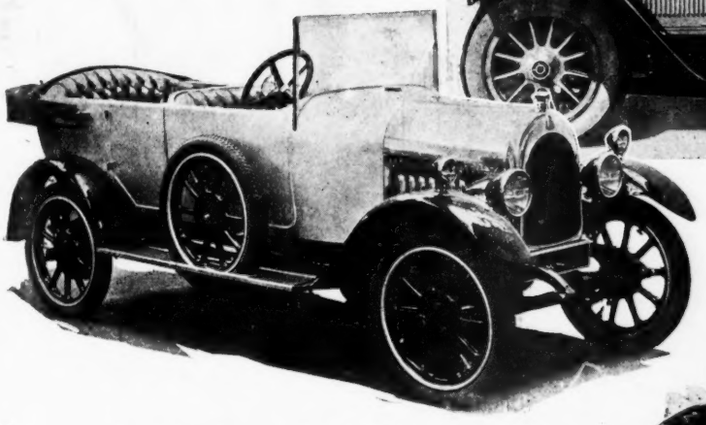
The Cunningham car with aluminum body



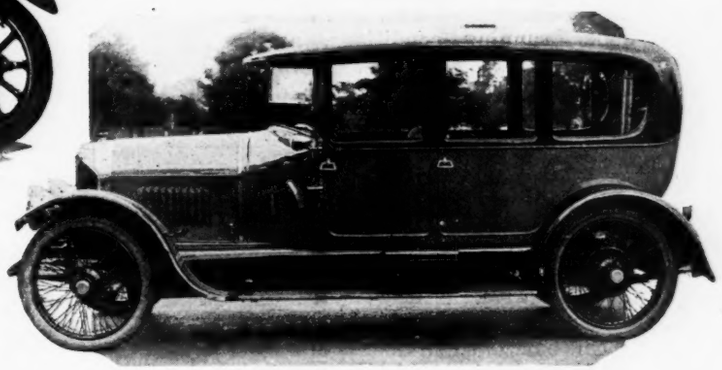
Farnham and Nelson aluminum construction



Rubay company's aluminum sedan



Cast aluminum body of Harper Bean, Ltd.



Crossley car with aluminum paneling by Cunard Co.

The increasing use of aluminum for bodies makes these models of particular interest to manufacturers

French Rotary Airplane Engine Uses a Variable Stroke

The two solutions so far advanced for overcoming the decrease in power caused by the low atmospheric pressure at high altitudes are the supercharger and supercompression in the cylinders. This article describes an attempt to change the compression by varying the length of stroke.

By W. F. Bradley

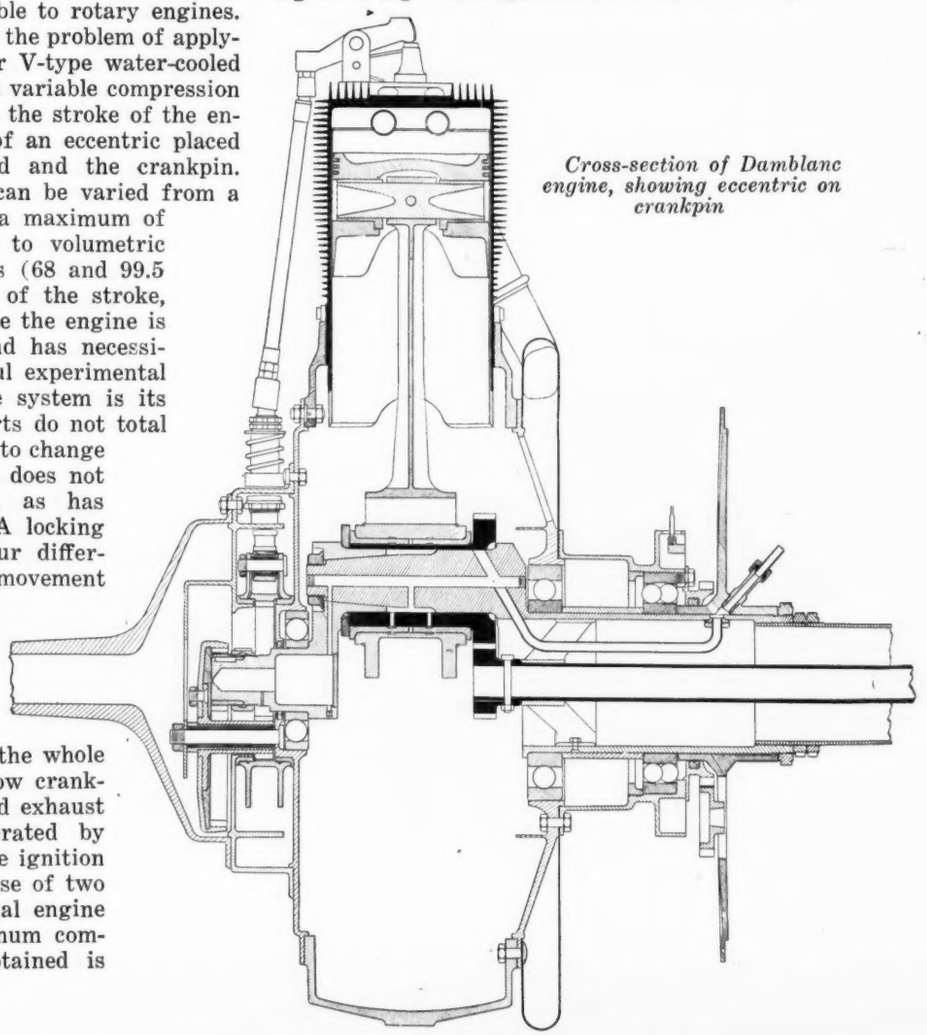
IN the effort to solve the problem of flight at high altitudes, which is attracting much attention in Europe, only two types of devices have as yet been evolved. One of these is the system of forced induction, of which the Rateau turbine compressor is the most successful example; and the other is a system of variable compression devised by the French engineer Louis Damblanc. An engine on these lines has been experimented by the French Army Aviation Technical Section and is about to be used by the aviator Casale on a Spad-Herbemont machine in an attack on the world's height record.

At the present time the Damblanc system of obtaining variable compression is only applicable to rotary engines. The inventor, however, is working on the problem of applying it to a fixed cylinder vertical or V-type water-cooled engine. Under the Damblanc system variable compression is obtained by mean of variations in the stroke of the engine, this being effected by means of an eccentric placed between the master connecting rod and the crankpin. With this device the piston stroke can be varied from a minimum of 150 mm. (5.9 in.) to a maximum of 172 mm. (6.77 in.) corresponding to volumetric compression between 4.8 and 7 kilos (68 and 99.5 lb.). This variation in the length of the stroke, obtainable from the pilot's seat while the engine is in motion, is somewhat delicate and has necessitated a large amount of very careful experimental work. The great advantage of the system is its extreme lightness, for the extra parts do not total more than 25 lb.; the effort required to change the compression is very slight, and does not change under running conditions, as has been proved in a 100 hour test. A locking mechanism is provided for the four different compression ratios, and the movement is obtained by means of a wheel on the engine mounting, within reach of the pilot.

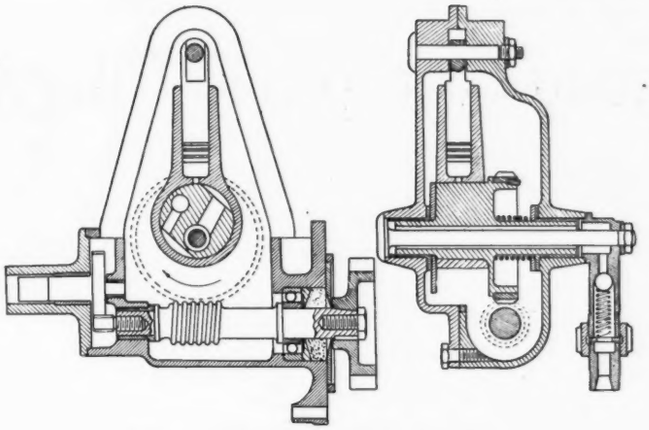
The Damblanc variable compression engine is a rotary type having 11 cylinders of 126 mm. bore mounted on a steel crankcase, the whole revolving around a fixed single throw crankshaft with ball bearings. Intake and exhaust valves are both mechanically operated by means of rockers and pushrods. The ignition is double for each cylinder by the use of two high-tension magnetos. At a normal engine speed of 1250 r.p.m. and the minimum compression of 68 lb., the power obtained is 220 h.p.

The cylinders are in steel, with radiating fins completely machined, and receive cast iron pressed-in liners. Valve seats are screwed into the cylinder head. Aluminum pistons are employed with Y type rings, giving a larger area and preventing gas leakages. Lubrication of the engine is under pressure, the oil being delivered through the crankshaft to the main and auxiliary connecting rods, and from them to the piston pins.

Timing of the engine is as follows: The intake opens with a lag of 5 deg. and closes with a lag of 50 deg.; the exhaust opening has a lead of 60 deg. and closes with a lag of 2 deg. The ignition advance is 20 deg.



Cross-section of Damblanc engine, showing eccentric on crankpin



Oil pump used on Damblanc engine

The Damblanc engine has a low weight per horsepower, for the power obtained at sea level is 220 h.p. and the weight in complete running order is 2.23 pounds per horsepower. According to tests made by the Technical Section of the French Air Service the fuel consumption is 0.55 lb. per horsepower hour, and the oil consumption 14 pints per hour.

The following table shows the comparative increases in power which can be obtained on an ordinary motor with a compression of 4.8 kilos (68 lb.), by the expedient of increasing the compression to the maximum of 7 kilos possible on a rotary type, and by the Damblanc system of variable compression.

ALTITUDE (in metres)	Best Volumetric COMPRESSION	POWER of ordinary engine with constant compression (4.8)	POWER of maximum compression engine	POWER developed Damblanc	INCREASE OVER ORDINARY ENGINE (1) by maximum compression motor	INCREASE OVER ORDINARY ENGINE (2) by Damblanc motor
0	4.8	178 HP.	178 HP.	178 HP.		
1,200	5.16	150 HP.	156 HP.	170 HP.	6 HP.	20 HP.
2,000	5.54	139 HP.	148 HP.	169 HP.	9 HP	30 HP.
3,000	5.9	122 HP.	135 HP.	168 HP.	13 HP.	46 HP.
5,000	7	95 HP.	112 HP.	166 HP.	17 HP	71 HP.

NOTE.—In the above table the Damblanc engine, is evidently compared with an ordinary engine with a stroke equal to the minimum stroke of the Damblanc. In our opinion it would be fairer to compare it with an engine having the maximum stroke.—EDITOR.

Ignition End Airplane Starter

ONE of the few concerns having attacked the aircraft engine starter problem is the Bijur Motor Appliance Co., which brought out a starter for the Liberty engine about two years ago. A new design of starter, which differs considerably in design from the former Bijur model, has just been announced. The screw shift drive is retained, but the exposed propeller hub gear ring is eliminated, and the whole mechanism is contained in a compact housing which is bolted directly to a crankcase flange at the non-driving end of the crankshaft, and adds only 5 in. to the total length of the plant.

Designed particularly to meet the requirements of the Liberty Twelve, this starter is adapted for use on a number of other leading engines, including the Curtiss C-12, Packard and Thomas-Morse. It may be had in either clockwise or anti-clockwise rotations, and for mounting with the electric motor located vertically either above or below the crankshaft center line.

The source of power is a 4 in. diameter, 12 volt, series electric motor which cranks the engine through a bevel gear and planetary reduction of 115 to 1 on the crankshaft. On the Liberty Twelve, the cranking speed is 40 to 50 r.p.m., with a current consumption of 110 to 150 amperes, varying according to the stiffness of the engine and the condition of the battery.

The well-known Bijur automatic shifting mechanism is employed, and the starter is connected to the crankshaft during the time of starting only. When the starting switch is depressed, permitting current to flow from battery to starter, the splined starter screw shaft moves longitudinally into mesh with splines cut internally in the hollow end of the crankshaft. This disengages automatically as soon as the engine begins to fire.

Special provision is made to disengage the starter pinion in case of a backfire while cranking, without damage to either starter or engine. By applying a wrench, brace or crank handle to the nut protuding from the back of the starter housing, the apparatus becomes a hand starter with a reduction of 20 to 1, with both automatic engagement and safety devices functioning.

Special attention has been given to obtaining minimum weight and small size without sacrifice of strength or performance. The mechanism weighs slightly less than 30 lb. Being mounted on the engine crankcase by means of a flanged mount, which is held by five studs, no shimming or adjusting is necessary.

Air Service Information Circulars

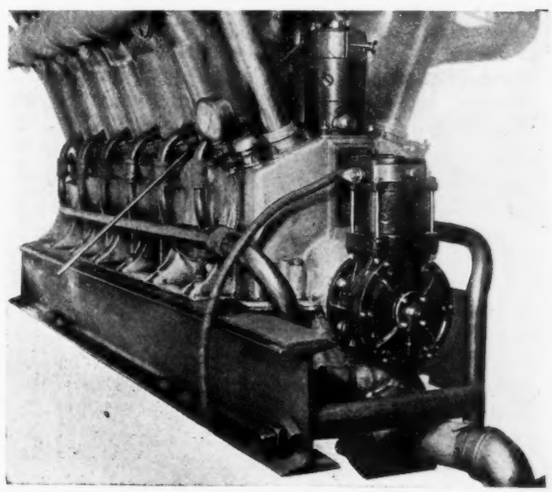
FOLLOWING are the titles of some of the information circulars recently issued by the Air Service, Washington, D. C.:

Report of Test of 37 Mm. Automatic Cannon in Cannon Engine.

General Descriptive Matter on Dopes and Instructions for the Application of Dope and Pigmented Protective Coverings.

General Descriptive Matter on Airplane Fabrics, Tapes and Cords, and Instructions for the Application of Fabric to the Wings.

An Empirical Theoretical Method of Comparative Prediction of Airplane Performance.



New type of Bijur aircraft engine starter on Liberty 12 engine

The Sparking Potential of Spark Plugs

The engine sub-committee of the British National Advisory Committee for Aeronautics announces results of tests to learn how sparking voltage of the spark plug is affected by the form of the voltage curve and the form of the gap. With most of these plugs the gap was adjusted to 0.0151 in.

TESTS made by the Engine Subcommittee of the British National Advisory Committee for Aeronautics throw considerable light on the question as to how the sparking voltage of a spark plug is affected by the form of the voltage curve and the form of the gap. Sixty-one spark plugs were submitted to tests, and with the exception of a few in which the length of gap could not be adjusted, the gap was adjusted to 0.0151 in. In a first series of experiments the sparks occurred in air at room temperature and pressure; in a second under a pressure of 96 lb. per sq. in. The conclusions of the first series of experiments are summarized thus: "The spark plugs may be divided into two groups—normal and abnormal. By normal plugs are meant those which have a sparking potential which is independent of the wave form of the applied potential, and also independent of the exact shape of the electrodes so long as the radius of curvature is not too small; this normal sparking potential is the same as that between spheres of 1 cm. diameter.

"The direct cause of abnormality would seem to lie in a special surface condition of the electrodes."

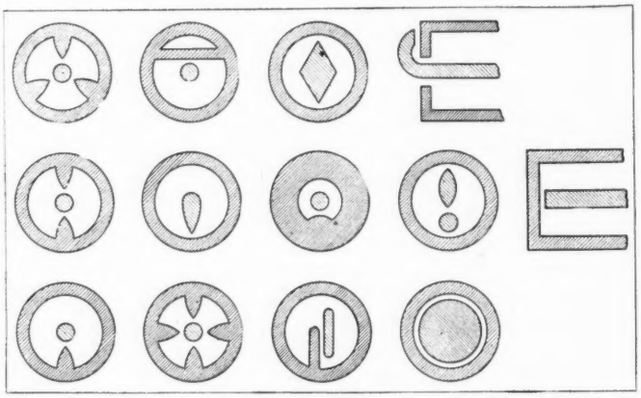
The conclusions of the second series of experiments were stated as follows:

"The normal sparking potential of a gap of 0.015 in. in air at a pressure of 96 lb. per sq. in. above atmospheric is about 10,500 volts. It is independent of the wave form, of the shape of the electrodes within wide limits, and of the insulation by which they are supported.

"The majority of the plugs examined give the normal sparking potential. A few give an abnormally low sparking potential, as low as 7000 volts in some cases; none has a sparking potential notably higher than the normal. No explanation of the abnormality is offered, but the obvious suggestion that it is connected with the presence of sharp points has some evidence in its favor. With one possible exception there does not appear to be any correlation between abnormality and the type of the plug.

"So long as the insulation resistance of the plug is greater than 100 megohms (as is the case with all the plugs examined), variations in that resistance have no effect on the sparking potential with a magneto."

The sparking potential was measured in three different ways. In the first two an alternating current of nearly sine form was applied to the spark points and the potential raised until a continuous spark was maintained. The voltage was determined by means of an alternating current voltmeter—this constituting the first method—and by an arrangement for measuring peak voltage. The third method consisted in using this same arrangement with potential from a magneto applied to the spark points. The different methods agreed very closely in their results.



Types of spark plug points

Definiteness of the Spark Potential.—With some of the plugs the sparking potential was perfectly definite; as soon as a spark occurred at all it continued as long as the potential was unchanged. With others there was an appreciable range of potential over which a spark sometimes, but not always, passed; in making observations on such a plug a spark would occur and perhaps continue for a second or two, but would then cease and not recur until the potential was raised further. The indefiniteness varied considerably in degree; with some gaps the range of potential over which the sparking was irregular was only 200 or 300 volts—with others it amounted to more than 1000 volts in a total of 2500. Moreover, the range was generally greater with the magneto than with the sine wave, but the difference with the two sources of potential was doubtless due in part to the fact that the potential given by the magneto is not strictly constant. No attempt has been made to estimate the indefiniteness quantitatively, or to determine the range of potential over which the sparking was irregular, but it was easy in nearly all cases to say with certainty whether or not the sparking was definite.

Analysis of Results.—Of twenty-two plugs classed as normal seventeen required an average sine wave peak voltage of 2232 for continuous sparking, and an average magneto voltage of 2239. The sparking potential appears to be independent of the wave form. For all except five plugs of the group the sparking potential lies between 2100 and 2300 volts, and in view of the difficulty of setting the gaps to exactly the same distance, variation within these limits does not exceed the experimental error. Of the five exceptional plugs four had non-adjustable spark points and one had a fine platinum wire electrode the radius of curvature of which was less than that of any other electrode in the plugs of this group.

It would be expected that pointed electrodes, by which are meant electrodes with radius of curvature much smaller than the sparking distance, would give a smaller sparking potential than spheres of much larger radius of curvature, but in this sense none of the electrodes concerned in the normal group are points when the sparking distance is only 0.015 in.

Twenty-two plugs with indefinite sparking potential required an average sine wave peak voltage of 2660 and an

average magneto voltage of 3050. This group differs from the normal group in that the sparking potential is notably higher with the magneto than with the sine wave, and both sparking potentials are decidedly higher than those in the normal group. It would appear there is a connection between the three properties—definiteness, independence of wave form, and a sparking potential the same as that of the normal group.

One group of sixteen plugs was classed as abnormal plugs with definite sparking potential. The mean sine wave peak potential for these was 2286 volts, and the mean magneto potential, 2565 volts. Sparking voltage with magneto is therefore materially higher in this case.

All of the above experiments were carried out at atmospheric pressure, and the question then arose whether the difference in the sparking voltage of the abnormal plugs with sine wave and magneto current was a constant quantity or whether it varied with the compression. To settle this the second series of experiments were undertaken.

Since the sparking plugs are not perfectly gas-tight, it was not convenient to maintain the air pressure constant while the potential applied to the gap was altered. Accordingly, measurements were made by raising the pressure to about 106 lbs. per sq. in., applying a potential insufficient to produce a spark at that pressure, and then allowing the pressure to fall through 96 lb.; a few trials were sufficient to enable the initial potential to be set so that the spark first passed continuously when the pressure reached 96 lb. The sparking potentials given are those which first maintain a continuous spark as a slowly falling pressure reaches 96 lb.

The pressure chamber, into the walls of which the plugs were screwed, was not fitted with a window. In order to determine when a spark passed the chamber was connected to ground through a galvanometer.

It was found in these experiments that the indefiniteness of certain plugs only slightly exceeds the general experimental error, and since indefiniteness did not seem to be associated with any other important property of the gaps, it was not recorded.

It was found that the great majority of the sparking potentials lie between 10,000 and 11,000 volts; in view of the various sources of uncertainty (the difficulty of setting the gap accurately to the right distance is not the least of them) all values within these limits may be regarded as experimentally identical. The group of plugs for which both sparking potentials lie within these limits includes some with every arrangement of the electrodes, some with every kind of insulation, and some by each of the chief makers. It may be concluded, therefore, that the normal sparking potential of a gap of 0.015 in. at an excess air pressure of 96 lb. per sq. in. is about 10,500 volts. It is independent of the form of the electrodes (with a possible exception to be mentioned presently), of the nature of the insulation, and of the minor mechanical details in which the work of different makers differs.

Further, the normal sparking potential is almost or quite independent of the wave form. Among the plugs with normal sparking potential it will be found that most of them give a rather higher sparking potential with the sine wave than with the magneto. If the difference is real, the apparently lower sparking potential with the magneto is probably to be attributed to the occurrence of irregular high frequency surges which are not fully recorded by the instrument for measuring peak voltage. On the other hand, in some cases, the magneto sparking potential is the higher. In almost all these cases it was noted at the time of experimenting that the sparking with the magneto was slightly indefinite; any indefiniteness of sparking is sure to increase the apparent sparking potential with the magneto relatively to that with the sine wave. The differences between the two sparking potentials are, in any case, unimportant for practical purposes.

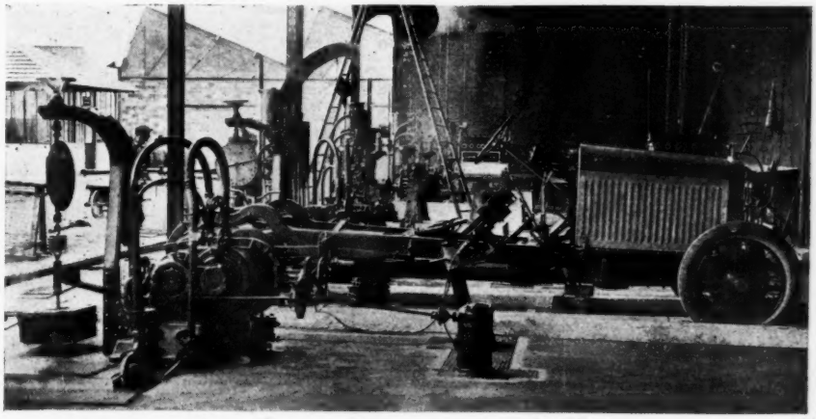
The existence of a "normal" sparking potential, which is independent of everything except the sparking distance and the medium in which the spark passes, is, of course, completely in accordance with the results obtained at the lower air pressure. It may be noted that whereas the air density is about seven times as great in these experiments as in those described previously, the normal sparking potential is only five times as great. The sparking potential does not increase as rapidly as the density, a result found by almost all the workers with all kinds of discharges in all gases.

Abnormal Plugs.—On the other hand, as before, there is a group of plugs with decidedly abnormal sparking potentials, the abnormal being now lower than the normal potential. In all but one of these the sparking potential with magneto was decidedly less than with sine wave.

French Maker Adopts Chassis Brake Test

IN addition to the usual bench test of the engine, all Hispano-Suiza cars are now tested by means of a couple of Froude brakes connected up to the axle shafts. The installation, which has just been completed, is believed to be the only one of its kind in France, and is the second to be delivered to an automobile manufacturer, the first having gone to the Daimler Co., at Coventry. This method of accurately measuring the power delivered at the road wheels has been adopted not only with a view to ascertaining the efficiency of the transmission, but to reduce the time spent on the road. As the Hispano-Suiza is capable, in chassis form, of a speed in excess of 85 miles an hour, accurate testing on the road became a very difficult matter and left too much in the hands of individual testers. Under the new system there is first an engine test, then a complete chassis test with the Froude brakes, and finally a short road test.

As shown in the illustration, one Froude brake is connected to each axle shaft, so that the differential gear acts in the usual way.



Testing Hispano-Suiza chassis by means of Froude brakes connected to the drive shafts

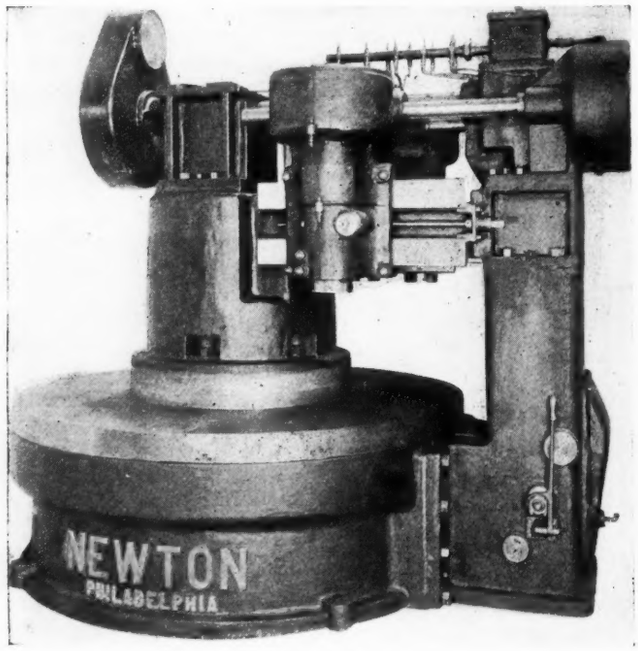
Ring Table Type of Newton Continuous Milling Machine

New type milling machine has circular base and central tapering column. This column is bolted and keyed to the base. The drive is on top of the machine, the motor gearing to a jackshaft. Rotation speed of base plate cannot be controlled by operator, but management can adjust it.

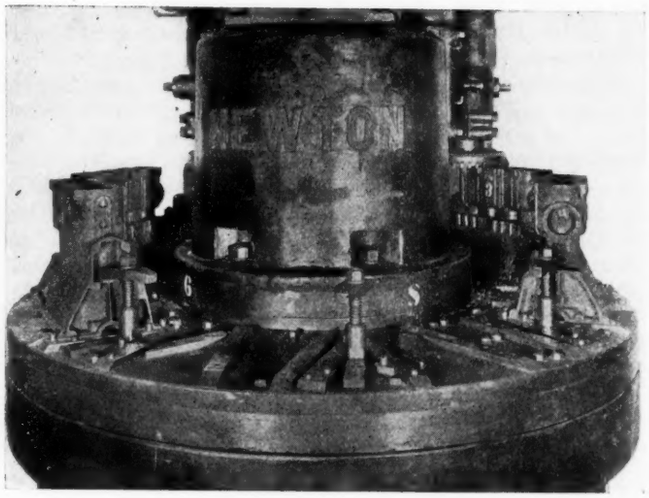
ANOTHER new type of continuous milling machine is presented by the Newton Machine Tool Works, Inc. The base is circular in form, and the machine has a central tapering column. The table casting is fitted to the central column at the base, and in addition is provided with an annular bearing close to the periphery of the table. The cross rail and the central upright are made in one piece so as to reduce the number of bolted connections. Thus in several particulars this machine differs from the continuous miller, manufactured by the same company, described in a recent issue of AUTOMOTIVE INDUSTRIES.

The table of this machine is 84 in. in diameter and the depth from the annular bearing to the top of the table is 12 in. The least diameter of the taper fit between the base column and the table is 36 in. The table is provided with a finished hub 42 in. in diameter, to assist in locating jigs on the table.

The central column is bolted and keyed to the base, and the cross rail is fitted in the front with one housing containing two spindles for the roughing cut. On the back of the cross rail and at a distance of 42 in. is a similar housing carrying a single spindle for the finishing cut. Both housings can be positioned on the cross rail so that where the machine is used for a variety of work, the spindles can be so positioned upon the table that the jigs can be made with the least angularity and the least loss of space between them. The outer end of the cross rail is supported by a column which is bolted and doweled to the base as well as the cross rail.



Newton ring form table type of continuous miller

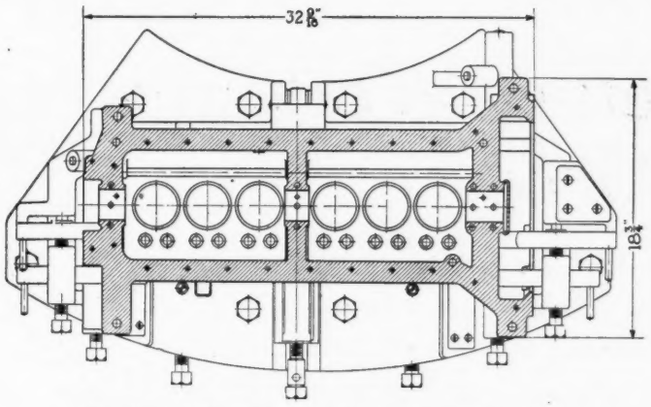


Jigging for facing off top of cylinder block in Newton ring table continuous miller

The drive is on top of the machine, the motor gearing to a jackshaft, and at the extreme outer end of the cross rail there is a box containing the gearing used to transmit the motion from the jackshaft to the two spindles. This permits of changing the spindle speeds when the grade of material or size of cutters is changed, the speeds of the two spindles being adjustable independently.

The rotative movement of the table is controlled by a fixed feed and the operator cannot increase or decrease the production of the machine, as a given number of stations pass the loading station per hour, hence that number of pieces must be machined. Provision is made, however, of means by which the management can change the rate.

The table itself is rotated by a herringbone gear 81 in. in diameter. Each of the spindles is provided with an individual adjustment for setting the cutter to gages. Different sizes of housings provide varying centers between the roughing spindles, depending upon the dimensions of the work. Generally, however, these centers are either 12 in. or 14 in. Both spindles are rotated inward or clockwise on the left hand spindle, and counter clockwise on the right hand spindle. With a distance of 42 in. between the centers of the two cutters, the roughing operation on a given casting is completed before the finishing operation commences, hence the finishing cutter is not influenced by the roughing operation, and owing to the slight cut taken by the finishing cutter, any inaccuracy resulting from either dull roughing cutters or inequality



Design of jig for operation on lower face of cylinder and crankcase block

of the castings is eliminated by the finishing cutter.

One of the illustrations herewith shows the methods of jigging for facing the upper end of a cylinder block. The jigs are of the open front design, in order to permit of the quick loading and unloading from a roller conveyor, and the time required for jigging a crankcase-cylinder block is less than one minute. These castings have been machined in a time of two minutes each, the usual practice running from 2½ to 3 minutes each. The success of this operation is ascribed largely to the drive by worms and worm wheels. Other essential elements are extreme ruggedness of all operating parts and great weight. The parts themselves are quite incapable of absorbing any of the vibration set up by the cutting actions, hence the machine is designed to absorb and dissipate such vibration.

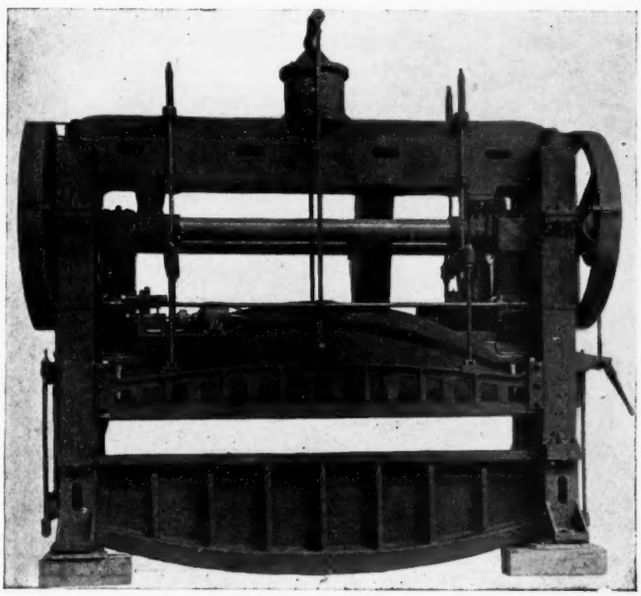
The character of the work usually presented to these machines does not require a great range of adjustment, hence, with the standardized model, this is taken up, first, by the adjustment in the spindle heads and, second, by variation in the height of the jigs themselves.

In the photograph showing the set up, the jigs are mounted upon a sub-plate. This is done because the particular factory in which this machine is used makes four models of engines, which made it necessary to quickly change from one group of jigs to another. The jigs were therefore mounted on a sub-plate made in two pieces so that only two sections had to be handled in changing from one model to another. This change is sometimes made two or three times in one week.

Tie Rod Presses for Stamping Out Pressed Steel Frame Members

THE adaptability of the tie rod form of press to large bending, blanking, pressing, shearing, multiple punching, group punching, and other similar operations is based upon three outstanding features: (1) All gears and operating parts are located overhead, so that the work can be placed into and removed from the front, the back or either end, the side housings being made with ample openings or windows between the tie rods. (2) The tables and rams are designed with ample die areas and openings and T-slots allow of the rearrangement of tools for various jobs. (3) All vertical operating stresses are taken up by heavy forged steel tension members which fasten table, housing and bridge tree together and eliminate the possibility of broken side housings.

Williams, White & Co. have recently completed two large tie rod presses of 500 and 800 ton capacities. These machines are being used to blank outside rails for motor vehicle frames, the former for passenger cars, the latter for trucks. These machines are designed along the same lines, and they are representative of the standard large press designs of the builders.



500-ton tie rod press for motor car frames

The die space adjustment is by large screws in the pitmans, operated through worm gearing by a separate motor mounted on the rams. The hold downs or strippers are of steel, with a T-slot in the face of each for attachment of specially shaped contact fingers and are operated by cams on the main crankshaft. The table on each machine has four T-slots and an opening 6 in. wide in the center, the length of the machine. The ram face has five T-slots. The clutch is of the friction type. An automatic stop and brake are provided. All gears are of steel. Twin drive is employed with cut tooth drive gears and pinions on each end of the main shaft, for equalizing the drive and eliminating torsional lag. An automatic die kick-out, connected to the ram and operated by it, is furnished to strip the work from the dies.

We illustrate herewith the 500 ton press for passenger car frames.

Facilities of English Ports

LONDON via Tilbury, or Southampton, Liverpool, Glasgow, and Bristol via Avonmouth are the chief ports at which American motors are landed. Just now a controversy is rife as to the rival merits of Liverpool and Avonmouth. The port charges at Avonmouth are lower than at Liverpool, but the latter port is served by a larger railway and distributing facilities, besides being geographically the better port for the vast market of Lancashire and Yorkshire. Bristol (or Avonmouth) is the ideal port for the west of England, but has no better right to be considered a national port than, say, Cardiff, the capital of South Wales. For assembling facilities and proximity to labor and materials' centers, undoubtedly Manchester, via the ship canal from Liverpool, stands first.

A Method of Routing Work in a Gear Shop

Here is a routing system that has been in operation since 1912 in one department of a factory and has extended to other departments. It has its faults, but they are chiefly those of the human inclination on the part of certain persons to "play safe," but the results have been unusually excellent.

By J. A. Urquart*

IN making estimates on gear work, especially new work, it is our practice to get the time required for each operation and delivery dates from each department that has an operation on the gear.

When estimating we make use of printed forms, one of which is sent to each of the foremen of the various departments who has work to perform on the piece. On this form (Fig. 1) the foreman is given the number of pieces to be estimated on and he is also furnished with a drawing of the piece (Fig. 2) for other information. This form, with drawing, is returned to the estimating department by the foreman of each department with an estimate of the number of hours required to do the work; also the special tools required by him to make the piece.

These estimates are filed for future reference. When an order that we have estimated on is received, a production record card (Fig. 3) is sent to each of the various foremen, giving them a record of their estimate. This record is to remind them of what they have promised to do and gives them a space to make a record of the time spent on the job and to check up each day to determine how they are coming out.

We also use a summary card (Fig. 4A) to show the sum total of labor and machine time estimated. This summary card has a drawing (Fig. 4B) or photostat of the gear pasted on the back of it. These cards are filed in a cabinet according to the pitch diameter of the gear. This record is valuable for quick estimating and also as a permanent record.

It was the wish to make use of this recorded information that led us to incorporate it in the form of a route card. The form which we decided to adopt is very similar to a railroad time table.

How Route Card Is Made.—Many of our gear orders are for special gears and are generally wanted by the customer about the time we get the order to make them. This means that the best possible date must be given.

When an order of gears is received we first apply to the timekeeping department for a number for the job. All labor and material used is charged against this number. We also get from the drafting department the necessary drawing (Fig. 2), also any list of materials or parts. This drawing generally gives a list of any special tools that may be required. The list or order of operations is furnished or approved by the foreman of the gear department.

The next step is to get actual or estimated time for each operation from the department that has the particular operation to perform. Each department foreman is told the day that the job will arrive in his department, and he gives the routing department the date on which the work will leave. The date given by the foreman who has the last operation to do gives us a final route card date, but it may not be near enough to the date asked for by the customer to be satisfactory. When this happens to be the case, the foreman of the gear department checks the routing, and from his records or experience, points out the operation which in his opinion can be shortened. The routing department then schedules a shorter date if possible. The final date is then set and the route cards are made. A number of days, depending on the size of the job, is added to the route card date to get a shipping date for the customer.

The route card is typed with a hectograph ribbon, and a copy is made on a duplicating machine for each foreman who has an operation on the gear. The route card and drawing are put in an envelope and stay with the work until it reaches the final inspection. The copies of the route card are sent to the various foremen.

The route card (Fig. 5) is about the same as a railroad time table. The "operation" and "date due" columns correspond to the "station" and "train due" columns on the table. There are, in addition, three other columns, one to show the date the parts were received, one to show the number of pieces sent along, and one to show the number of pieces spoiled, if any. The number of pieces sent along plus the number spoiled should always equal

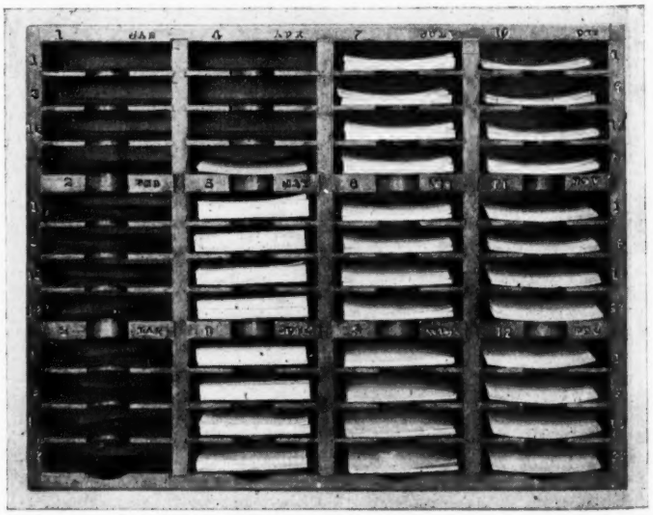
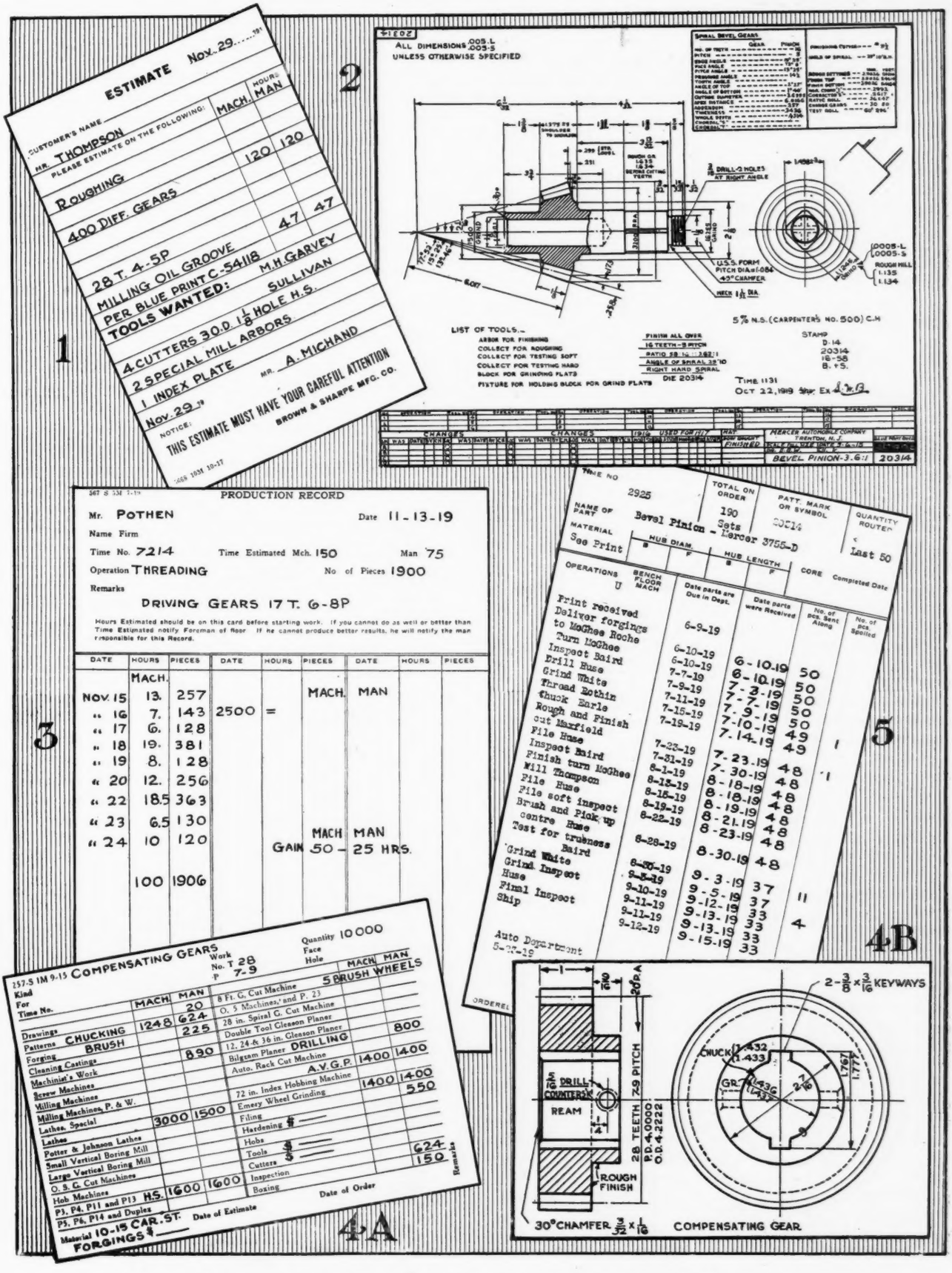


Fig. 6—Route card rack

*Mr. Urquart of the Brown & Sharpe Mfg. Co. read this paper before the American Gear Makers' Association. It is slightly condensed in these pages.


ESTIMATE Nov. 29
CUSTOMER'S NAME MR. THOMPSON
PLEASE ESTIMATE ON THE FOLLOWING:
MACH. HOURS MAN
ROUGHING 120 120
400 DIFF. GEARS
28 T. 4-5P 47 47
MILLING OIL GROOVE
PER BLUE PRINT C-54118
TOOLS WANTED: M.H.GARVEY
4 CUTTERS 30.D 1 1/8 HOLE H.S. SULLIVAN
2 SPECIAL MILL ARBORS
1 INDEX PLATE MR. A. MICHAND
Nov. 29
NOTICE:
THIS ESTIMATE MUST HAVE YOUR CAREFUL ATTENTION
BROWN & SHARPE MFG. CO.
1
2
ALL DIMENSIONS .005-L .005-S UNLESS OTHERWISE SPECIFIED
SPIRAL BEVEL GEARS
GEAR PINION
LIST OF TOOLS
ARBOR FOR FINISHING
COLLECT FOR ROUGHING
COLLECT FOR TESTING SOFT
COLLECT FOR TESTING HARD
BLOCK FOR GRINDING FLATS
FIXTURE FOR HOLDING BLOCK FOR GRIND FLATS
FINISH ALL OVER
16 TEETH - 8 PITCH
RATIO 2.0 1/4 : 1.937 : 1
ANGLE OF SPIRAL 35°10
RIGHT HAND SPIRAL
DIE 20314
5/8 N.S. (CARPENTER'S NO. 500) C.M
STAMP
D-14
20314
16-58
8. +S.
TIME 1131
OCT 22, 1919
CHANGES
MERCER AUTOMOBILE COMPANY
TRENTON, N. J.
BEVEL PINION-3.6:1 20314
PRODUCTION RECORD
Mr. POTHEN Date 11-13-19
Name Firm
Time No. 7214 Time Estimated Mch. 150 Man 75
Operation THREADING No of Pieces 1900
Remarks
DRIVING GEARS 17 T. 6-8P
Hours Estimated should be on this card before starting work. If you cannot do as well or better than Time Estimated notify Foreman of floor. If he cannot produce better results, he will notify the man responsible for this Record.
DATE HOURS MACH. PIECES DATE HOURS MACH. PIECES DATE HOURS MACH. MAN PIECES
Nov. 15 13. 257
" 16 7. 143 2500 =
" 17 6. 128
" 18 19. 381
" 19 8. 128
" 20 12. 256
" 22 18.5 363
" 23 6.5 130
" 24 10 120
100 1906
GAIN 50 - 25 HRS.
3
TIME NO 2925
TOTAL ON ORDER 190 Sets
PATT. MARK OR SYMBOL 20314
QUANTITY ROUTED Last 50
NAME OF PART Bevel Pinion - Mercer 3755-D
MATERIAL See Print
HUB DIAM. B F HUB LENGTH B F CORE
OPERATIONS U BENCH FLOOR MACH Completed Date
Date parts are Due in Dept. Date parts were Received No. of pcs. Sent Along No. of pcs. Spoiled
Print received 6-9-19
Deliver forgings to McGhee Roche 6-10-19
Turn McGhee 6-10-19 6-10-19 50
Inspect Baird 7-7-19 6-10-19 50
Drill Huse 7-9-19 7-3-19 50
Grind White 7-11-19 7-7-19 50
Thread Bothin 7-15-19 7-9-19 50
Chuck Earle 7-19-19 7-10-19 49
Rough and Finish cut Maxfield 7-14-19 49 1
File Huse 7-22-19 7-23-19 48
Inspect Baird 7-31-19 7-30-19 48 1
Finish turn McGhee 8-1-19 8-18-19 48
Will Thompson 8-13-19 8-18-19 48
File Huse 8-15-19 8-19-19 48
File soft inspect 8-19-19 8-21-19 48
Brush and Pick up centre Huse 8-22-19 8-23-19 48
Test for trueness Baird 8-28-19 8-30-19 48
Grind White 8-30-19 9-3-19 37
Grind Inspect 9-5-19 9-12-19 37 11
Huse 9-10-19 9-13-19 33
Final Inspect 9-11-19 9-13-19 33 4
Ship 9-12-19 9-15-19 33
Auto Department 9-17-19
5
4B
257-S IM 9-15 COMPENSATING GEARS
Kind For Time No.
Work No. T 28 P 7-9
Quantity 10000
Face Hole
MACH MAN
Drawings
Patterns CHUCKING 1248 624
Forging BRUSH 225
Cleaning Castings 890
Machinist's Work
Screw Machines
Milling Machines
Milling Machines, P. & W.
Lathes, Special 3000 1500
Lathes
Potter & Johnson Lathes
Small Vertical Boring Mill
Large Vertical Boring Mill
O. S. G. Cut Machines
Hob Machines H.S. 1600 1600
P3, P4, P11 and P13
P5, P6, P14 and Duplex
Material 10-15 CAR. ST. FORGINGS $
Date of Estimate
Date of Order
Remarks
5 BRUSH WHEELS
8 Ft. G. Cut Machine
O. 5 Machines, and P. 23
28 in. Spiral G. Cut Machine
Double Tool Gleason Planer 800
12, 24-& 36 in. Gleason Planer
Bilgram Planer DRILLING
Auto. Rack Cut Machine 1400 1400
A.V.G.P.
72 in. Index Hobbing Machine 1400 1400
Emery Wheel Grinding 550
Filing
Hardening $
Hobs
Tools $
Cutters $ 624 150
Inspection
Boxing
4A
2-3/8 x 3/16 KEYWAYS
CHUCK 1.432 1.433
GR. 1.436 1.437
1.767 1.777
DRILL COUNTERSINK REAM
28 TEETH 7.9 PITCH
P.D. 4.0000
O.D. 4.2222
ROUGH FINISH
30° CHAMFER 3/32 x 1/16
COMPENSATING GEAR

Figs. 1 to 5—Some of the forms and style of drawings used in Brown & Sharpe system

the number started. The route card is used as a casting order for cast iron gears.

Route Card Rack.—Each department in the factory is provided with a rack (Fig. 6) containing forty-eight pockets, four for each month. In these pockets are placed the copies of the route card as fast as they are issued. The copies are filed in the rack according to the date that they are due out of the department. This arrangement of the route card copies enables the foreman to tell at all times the quantity of work that he has to get out each week; also all work on order that he has an operation on. It also gives him this information in advance and shows up any work that he has not moved according to schedule.

Spoiled Work.—If any pieces are spoiled a "spoiled work" notice (Fig. 7) is sent to the routing department. It is the duty of the routing department on the receipt of this notice to find out if the spoiled pieces have to be replaced and if so, to start the number required on a new route card, and have them catch up with the main lot as soon as possible.

Rerouting.—It is necessary at times to change the dates on a route card. This change is due to various reasons, such as delay in receiving raw materials, to get a shorter date, men out, machine broken down, neglect on part of foreman, too much work, etc. To take care of this condition we have a reroute ticket (Fig. 8). This reroute ticket gives the routing department the information necessary to reroute and to locate the job after rerouting. Whenever a foreman learns that the date on a route card in his department is not going to be kept he must notify the routing department at once, and at the same time give a new moving date if possible. This reroute notice corresponds to the blackboard that is set up in railway stations to keep the public notified of delays in train movements.

When the information on the reroute is noted the routing department can take steps to hold the final date or to make the extension as short as possible. This can be taken care of in several ways, such as overtime, getting help from another department (as we have several departments doing similar work) by doubling up, etc. But the important thing is for the foreman to give prompt notice to the routing department in order that the control of the job may not be lost. I wish to say that as a rule the foremen give this notice. We do not use chasers or follow up men, except in special cases. When a date cannot be kept, the reroute slip gives the date on which the work will move out of the department. We make out a reroute card, take it to the department which has the work, take the drawing out of the envelope, and put it in the reroute envelope and take away the old route card. The fact that there is always a route card with the work helps the routing department to have control of all work in progress at all times.

Scheduling to Departments.—Work is scheduled to departments, not to machines, except on certain machines such as gear planers, hobbing machines, etc., where the number of machines is limited. On the common class of machines, such as lathes, drill presses, etc., we depend on the foreman with the aid of his route card rack to bring to the attention of the general foreman any work that he is not sure of getting out according to schedule. This plan has its weak points, but any cure that we have seen is worse than any trouble we are having at the present time.

Dispatching and Trucking.—Each foreman dispatches the work from his own department. The moving is done by the trucking department, but the foreman who works on the job last is responsible for the work until it reaches the next department.

All moving of parts in the factory is handled by the trucking department. Call stations are located in each department of the factory, and there is one central transfer station. Starting in the morning, each trucker leaves the transfer station with any parts that are going to his station. Upon his arrival at the floor where his station is located, he distributes his load, and going to his station, he loads up with the parts for the transfer station. The route card with the work is the trucker's move order.

How Stock Orders Originate.—Machine parts are generally routed to go into stock, and as a rule we have more time allowed for manufacturing than on special orders. This allows us to use some methods different from those we use in routing gears, but most of the rules are the same.

All orders for standard machinery originate in the sales department.

Copies of orders are sent to:

1. The timekeeping and cost departments. They open accounts for time and material and figure cost at completion of job.
2. The drafting department. They furnish all necessary drawings and lists of furnishings, including stock parts.
3. The foreman erecting the machines. He gives a date when the machines will be finished. This date must be approved by the routing department and be satisfactory to the sales department.
4. Routing department. They, on receipt of lists and drawings, make requisitions for all stock parts and material. These requisitions bear the date that parts will be wanted in the assembling or erecting departments. They also order through the purchasing department all special materials or parts. Parts not carried in stock but manufactured as required are routed through the factory.

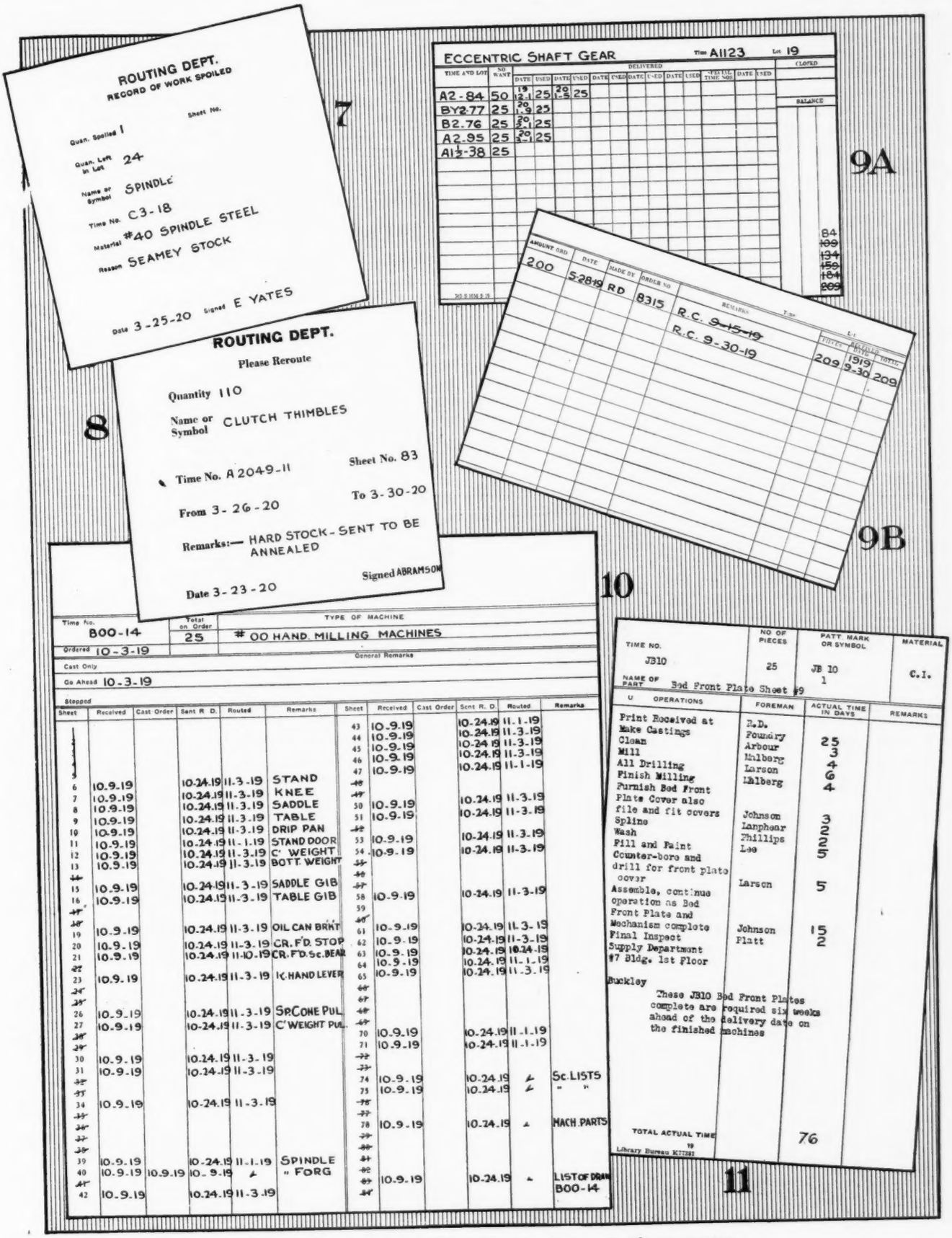
Ordering.—When the lists of material for a lot of machines are received in the routing department from the drafting department, the stock parts order clerk immediately checks the list with his stock record cards (Fig. 9). All the items required that are not in stock are ordered. Items not required for some time are held in the "tickler" until an advisable date for ordering. A copy of the order is sent to the drafting department which in turn sends to the routing department drawings for each piece called for on the order. The material order clerk in the routing department takes each drawing and makes out requisitions for all stock parts; also requisitions for all special parts. The drawing, all requisitions, and a route card without the operations or dates but giving the number of pieces required, time number of job and name of part, are then sent to the route clerk who proceeds to schedule and route the work.

These stock record cards are a great help to the route clerk in setting dates.

The material order clerk keeps a record (Fig. 10) of all the drawings received in the routing department. This record gives date received, when sent to routing department, and when routed.

Master Card and How Used.—The method of routing is as follows: We have a master card (Fig. 11) for each piece to be routed. This card gives the operations and the number of hours or days required for each operation. It also gives the name of the foreman who is to do the work. This is necessary because we have several departments for doing the same kind of work, such as lathe, milling, drilling, etc.

The operations on our master cards are made by recording the operations in the order in which they have been performed in the past, and are changed from time to time as new methods of manufacturing require. The



7

ROUTING DEPT.
RECORD OF WORK SPOILED

Quan. Spoiled 1 Sheet No.
Quan. Left in Lot 24
Name or Symbol SPINDLE
Time No. C3-18
Material #40 SPINDLE STEEL
Reason SEAMEY STOCK
Date 3-25-20 Signed E YATES

9A

ECCENTRIC SHAFT GEAR Time A1123 Lot 19

TIME AND LOT	NO WANT	DELIVERED DATE	USED	DATE	USED	CLOSED
A2-84	50	19 12-1	25	20 1-5	25	
BY2-77	25	20 1-9	25			
B2.76	25	20 2-1	25			
A2.95	25	20 3-1	25			
A1-38	25					

BALANCE: 84 ~~109~~ ~~134~~ ~~159~~ ~~184~~ ~~209~~

8

ROUTING DEPT.
Please Reroute

Quantity 110
Name or Symbol CLUTCH THIMBLES
Time No. A2049-11 Sheet No. 83
From 3-26-20 To 3-30-20
Remarks:— HARD STOCK - SENT TO BE ANNEALED
Date 3-23-20 Signed ABRAMSON

9B

AMOUNT ORD	DATE	MADE BY	ORDER NO	REMARKS	TYPE	LEFT TIMES	LEFT REVISED DATE	LEFT TOTAL
200	5-28-19	RD	8315	R.C. 9-15-19		209	1919 9-30	209
				R.C. 9-30-19				

10

Time No.	Total on Order	TYPE OF MACHINE
B00-14	25	# 00 HAND MILLING MACHINES

Ordered 10-3-19
General Remarks
Cast Only
Go Ahead 10-3-19

Stepped Sheet	Received	Cast Order	Sent R. D.	Routed	Remarks
1					
2					
3					
4					
5					
6	10.9.19		10.24.19	11.3.19	STAND
7	10.9.19		10.24.19	11.3.19	KNEE
8	10.9.19		10.24.19	11.3.19	SADDLE
9	10.9.19		10.24.19	11.3.19	TABLE
10	10.9.19		10.24.19	11.3.19	DRIP PAN
11	10.9.19		10.24.19	11.1.19	STAND DOOR
12	10.9.19		10.24.19	11.3.19	C' WEIGHT
13	10.9.19		10.24.19	11.3.19	BOTT. WEIGHT
14					
15	10.9.19		10.24.19	11.3.19	SADDLE GIB
16	10.9.19		10.24.19	11.3.19	TABLE GIB
17					
18					
19	10.9.19		10.24.19	11.3.19	OIL CAN BRKT
20	10.9.19		10.24.19	11.3.19	CR. F'D. STOP
21	10.9.19		10.24.19	11.10.19	CR. F'D Sc. BEAR
22					
23	10.9.19		10.24.19	11.3.19	K. HAND LEVER
24					
25					
26	10.9.19		10.24.19	11.3.19	SR CONE PUL.
27	10.9.19		10.24.19	11.3.19	C'WEIGHT PUL.
28					
29					
30	10.9.19		10.24.19	11.3.19	
31	10.9.19		10.24.19	11.3.19	
32					
33					
34	10.9.19		10.24.19	11.3.19	
35					
36					
37					
38					
39	10.9.19		10.24.19	11.1.19	SPINDLE
40	10.9.19	10.9.19	10.9.19	〃	〃 FORG
41					
42	10.9.19		10.24.19	11.3.19	
43	10.9.19		10.24.19	11.1.19	
44	10.9.19		10.24.19	11.3.19	
45	10.9.19		10.24.19	11.3.19	
46	10.9.19		10.24.19	11.3.19	
47	10.9.19		10.24.19	11.1.19	
48					
49					
50	10.9.19		10.24.19	11.3.19	
51	10.9.19		10.24.19	11.3.19	
52					
53	10.9.19		10.24.19	11.3.19	
54	10.9.19		10.24.19	11.3.19	
55					
56					
57					
58	10.9.19		10.24.19	11.3.19	
59					
60					
61	10.9.19		10.24.19	11.3.19	
62	10.9.19		10.24.19	11.3.19	
63	10.9.19		10.24.19	10.24.19	
64	10.9.19		10.24.19	11.1.19	
65	10.9.19		10.24.19	11.3.19	
66					
67					
68					
69					
70	10.9.19		10.24.19	11.1.19	
71	10.9.19		10.24.19	11.1.19	
72					
73					
74	10.9.19		10.24.19	〃	Sc. LISTS
75	10.9.19		10.24.19	〃	〃 〃
76					
77					
78	10.9.19		10.24.19	〃	MACH. PARTS
79					
80					
81					
82					
83	10.9.19		10.24.19	〃	LIST OF DRAW. B00-14
84					

11

TIME NO.	NO. OF PIECES	PATT. MARK OR SYMBOL	MATERIAL
JB10	25	JB 10 1	C.I.

NAME OF PART Bed Front Plate Sheet #9

U	OPERATIONS	FOREMAN	ACTUAL TIME IN DAYS	REMARKS
	Print Received at	R.D.		
	Make Castings	Foundry	25	
	Clean	Arbour	3	
	Mill	Malberg	4	
	All Drilling	Larson	6	
	Finish Milling	Malberg	4	
	Furnish Bed Front Plate Cover also file and fit covers	Johnson	3	
	Spline	Lanphear	2	
	Wash	Phillips	2	
	Fill and Paint	Lee	5	
	Counter-bore and drill for front plate cover	Larson	5	
	Assemble, continue operation on Bed Front Plate and			
	Mechanism complete	Johnson	5	
	Final Inspect	Platt	2	
	Supply Department #7 Bldg. 1st Floor			

Buckley

These JB10 Bed Front Plates complete are required six weeks ahead of the delivery date on the finished machines

TOTAL ACTUAL TIME 76

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Figs. 7 *to* 11—*Additional forms used in Brown & Sharpe system*

time required for each operation is taken from the contract or job work cards when available. On new work we get an estimated time from the foreman having charge of that particular job.

We have from the foreman building the machines the date on which the machines are to be finished. We have records obtained by experience to show the time that each part or group must be finished in order to keep the date set on the complete machine. With all this information it is a comparatively simple job to divide the available time between the various operations. In the majority of cases the time given on the route card is greater than the actual time required for the operation. This helps us to hold the original date on the route card when we have to reroute.

On rush orders the route card is put in a red envelope. This helps the foremen to keep the job moving on time unless rush orders should become too common.

Record of Work in Progress.—The routing department has two sets of filing cabinets, one for all work in process of manufacturing, and one for work that has been finished. The work-in-progress cabinet contains a copy of the route card for every job in progress, filed according to name or job number.

The completed file contains a copy of route cards for all jobs finished on which the cost has not been figured. As fast as the cost department figures the job, the cards are pulled out and destroyed.

With the aid of these two cabinets we can locate any job very quickly. We can also give the condition of all the parts for any lot of machines under construction.

Rules

1. Dates on route cards should be kept or bettered.
2. If a date on route card cannot be kept, the foreman should notify the routing department at once and not wait until work is finished, and on the same note give the date on which the work will go to the next operation. This reroute note should be written in duplicate, the original should be sent to the routing department and the duplicate should be pinned to the foreman's route card and filed in rack according to the new moving date. This will remain in rack until receipt of the new reroute copy from the routing department. Printed forms are provided for this purpose.
3. Foremen should write "Being Rerouted" on route card and sign their name and date whenever notifying the routing department to reroute work.
4. Routing department must reroute work promptly, but work must be kept moving during the time it is being rerouted. If a route card arrives in a department and has been marked "Being Rerouted" but has not been rerouted within three days after the date of notification, the foreman having the work must send through a new reroute note.
5. If a job should get so far behind that it is difficult to reroute to meet machine date, the routing department will notify the foreman building the machines.
6. The route card and blue print in envelope must be kept with the work, not on the foreman's desk.
7. The foreman's copy of the route card must be filed in racks, provided for that purpose, according to the date the work is due out of the department, except the assembling and erecting departments on groups or machines. They should file route card by time number.
8. Copies of route cards for jobs that have been rerouted or finished must be removed from rack promptly.
9. Foremen must not use racks to store all sorts of junk. If jobs are stopped the copies should be marked.
10. All foremen must enter on their copy of route card the date on which they receive the work. Then the routing department can get this information without troubling the foreman.
11. Route card with blue print must be returned to routing department promptly upon completion of job.
12. The routing department is responsible for getting best dates on all outside repair orders, "CUSTOMER WAITING orders," etc. It is expected that the foremen will assist them in every possible way.
13. The foreman whose name appears on bottom of each route card is responsible for the work and will give information on any mechanical question that may come up.

Results.—Routing started in the gear department in 1912. It is now in general use through our factory.

Results	Total	On Time Per Cent	1 Week Per Cent	2 Weeks Per Cent
1913.....	24,990	76.5	84	89.5
1914.....	28,037	80.9	90.5	94.3
1915.....	43,795	68.5	80.3	88.7
1916.....	61,173	71.5	79	86.5
1917.....	66,926	87.6	90.7	93.8
1918.....	66,817	85	88	91.7
1919.....	61,622	85	87.6	90

This record would be better but for the tendency of our route clerks to play safe. They sometimes call for parts sooner than actually required and quite often the foreman making the part knows this and breaks the rule on rerouting, making the excuse that he knew that they would not be required on the date set. This applies mostly to the foreman on the last operation.

We try to impress the foreman, however, with the fact that dates on route cards must be kept, and if in their opinion the dates are not correct, they should call this to the attention of the routing department.

Benefits of Routing

1. Work is all laid out for foremen, so that they can devote their whole time to getting out the work.
2. Every part that should be is started as soon after the order is placed as is necessary to get the part finished on time.
3. True dates. Men are not working on parts before they should, but are working on the parts that are wanted.
4. It calls attention to departments that have more work than they can get out on time.
5. Saves trucking.
6. Shows why jobs are delayed. Waiting for tools, etc.
7. Prevents breaking up of lots.
8. The route card, when finished, gives a complete history of the job from the date of the order until finished.
9. Keeps all foremen in their own departments.
10. Time is not wasted following up jobs that are on schedule, as only jobs that are liable to be delayed are looked up.

In conclusion I want to call attention to two points in this plan of routing: One is its simplicity. All we ask of our foremen is to keep the schedule or report that they cannot do so. The other point is the fact that we have been using it for five years and are getting fairly satisfactory results.

OUR Belgian contemporary *L'Auto*, commenting on a transcontinental automobile record trip recently made in this country, figures out that at present gasoline prices in Belgium such a trip across the Continent and back would cost 4500 francs for fuel alone. It concludes by saying that Belgians may well congratulate themselves on living in a country where trips of such length are unnecessary and impossible, and that they should bless the treaty makers of Versailles for not having enlarged Belgium.

Tire Tariffs Handicap Motor Use in Australia

Head of trade association of Tasmania says situation there shows need of local factories. British automotive industry joins the government in plan for state-assisted research and extent to which work shall be followed is not being worked out. Other British notes of interest presented.

By Our London Correspondent

SPECIAL tire factories for the British group of Australasian Islands are suggested in recent remarks of President Duncan of the Motor Traders Association of Tasmania. His subject was the ill effect on the automotive trade by the tire tariffs of these possessions. He said that tires cost the consumer more in Australia than in any other country in the world, and he charged that the high tariff which had protected the Australian tire manufacturers for the past twenty years was no longer needed.

On a per capita basis, compared with the United Kingdom and the United States, there should be 200,000 cars used in Australia, but the total does not reach 60,000, which proves that the high cost of running a car in Australia, due principally to the excessive cost of tires, had had a blighting effect on the industry.

The motor user in Australia, continued Mr. Duncan, paid more than $6,250,000 annually in customs duties and State motor taxes. Tires in Australia cost 48 per cent more than in England; 80 per cent more than in the United States, and 27 per cent more than in New Zealand. For the fiscal year of 1917-18, imported rubber goods amounted to $2,460,000 and the duty collected was $1,005,000. As showing that Australian rubber manufacturers could compete on foreign markets against the world's tire manufacturers, he mentioned that the export value of Australian made tires increased from $415,000 in 1914-15 to $895,000 in 1917-18.

As regards the detrimental effect of the tariff on cars, the rates as recently revised are: 25 per cent preferential tariff on British cars, 35 per cent intermediate tariff and 40 per cent general tariff on pneumatic rubber tires and tubes, 20 to 30 per cent on cycle, motorcycle, and side-cars, parts, etc.; 30, 35 and 40 per cent respectively on motorcycles, side-cars, etc.; 7½, 12½ and 17½ per cent on chassis if unassembled; 30, 35 and 40 per cent respectively on single-seated bodies, and 50, 55 and 60 per cent respectively on double-seated bodies. The high tariff on imported bodies is primarily to stabilize a motor body building industry, and is the least harmful of these rates.

British Industrial Research

THE British motor industry were the first to take advantage of the Government's scheme of State-assisted research for industries which qualified for it by having subscribed a prescribed amount among the members. This effort is to the credit of the Association of British Motor & Allied Manufacturers. The members have a maximum subscription of $2,500 and a minimum rate of $250 per annum, intermediate subscriptions being at the rate of 72 cents per $500 of wages paid. In the motorcycle and cycle car manufacturers' group, the subscriptions are somewhat lower.

The question of the degree to which the two associations will collaborate has not yet been fully determined, but in all matters of this kind, the Government Department acts as a central organization to assist in the allocation and division of work where overlapping and duplication would otherwise be liable to occur. It is believed that the fuel problem will be first to be collaborated upon by the joint bodies.

Besides these efforts, the Institution of Automobile Engineers has been carrying on research work regarding automobile steels, of which the report will be published this fall at the offices of the Institution, 28 Victoria Street, London, S. W. The report will contain a vast amount of information in regard to the physical properties of the ten automobile standard steels of which the specifications are given in British Engineering Standards Association Report No. 75, with colored charts showing these properties under various heat treatments as represented by the tensile, Izod, and Brinell tests.

Sleeve Valve Engined Tractor

THE patent and manufacturing rights of the Burt single sleeve-valve engine have been acquired by Wallace-Glasgow, Ltd., at Cardonald near Glasgow, builders of the "Glasgow" tractor, which is to be fitted with that type of engine. The engine in question is better remembered as the "Argyll," since it was developed and first used by the (now defunct) Argyll Motors, Ltd. The same engine is to be fitted to the truck of the Caledon Co. of Glasgow, and the motorcycle of Barr & Stroud of Glasgow. The latter company is new in the motor industry and has a great reputation for precision mechanism.

International Study

THE British Thomson-Houston Company, Ltd., has decided to establish two scholarships, one of which will be allotted to Cambridge. It proposes to select from the engineering graduates of that University, who have worked with the firm for not less than six months, a scholar who will be sent to their American associates, the International General Electric Company, with which is associated the General Electric Co. of New York. The company proposes to allow for the student's expenses for one year an equivalent of $1,800. After a year's study in America he will be expected to return to the British company.

The Small Town as a Manufacturing Center

The advantages of a small town as a manufacturing center, especially as regards industrial relationships, is well illustrated by the plant described in this article. Labor turnover is extremely small, and the management has gained the confidence of its employees to a remarkable extent.

By Norman G. Shidle

THE merits of the large city as compared with those of the small town as a manufacturing site have been frequently discussed, with honors about even in the long run. It is interesting to examine, however, the experience of a particular manufacturing plant, recently built up in a small Ohio town. The story of its development throws light upon the possibilities of the small town as a manufacturing center and emphasizes especially certain advantages to be gained from the labor standpoint.

The factory referred to is located in a town which now has about 500 inhabitants. The factory began operations six years ago with six employees; it now employs one hundred and forty men. Its product consists of replacement parts for automobiles, such as axle shafts, steering wheels, etc. The nearest city of any size is Cleveland, some forty-five miles away. Two passenger trains pass through this town each day; both of them stop.

The factory, as might be deduced, supplies employment for the majority of the male inhabitants. It has caused a very considerable development in the banking interests of the town, has been instrumental in the promotion of an adequate building program, and has aided materially in the development of sidewalks, paved streets and other civic improvements.

The Spencer Metal Products Co. did not begin manufacture in a small town by chance. Its founder had considerable industrial experience behind him at the time he began this undertaking and believed the labor situation to be the key to industrial success or failure. And he believed that better relationships could be built up in a small town than in any large city. He perceived, in addition, many other advantages to be gained from locating his plant in a small town. Among the most important of these may be cited the following:

1. **Cheap land.**
2. **Low taxes.**
3. **Transportation facilities less hampered by congestion than those of large urban centers.**
4. **Low labor turnover.**
5. **Greater efficiency from labor.**
6. **Adequate housing facilities for workmen.**
7. **Better opportunity to develop business entirely unhampered by labor troubles or policy of "the man across the street."**

Some of these advantages are obvious; the last four, however, may be disputed. They will at least bear discussion. The experience of this plant bears on that discussion very definitely.

The factory began work, as previously stated, with six men. These were skilled workmen, brought into the town by the founder of the company. These were picked employees; honest and sincere men as well as skilled mechanics. From this nucleus the organization was gradually built up.

Local men were encouraged to come to work at this plant. Men from outside the town were not encouraged. These local men were all farmers or the sons of farmers who had never done mechanical work. Many of them had never seen a lathe.

When employed, they were absolutely "green." The skilled men already at the plant taught them how to operate the various machines; many of the new men were made specialists on one machine, so that they could attain high production in a comparatively short length of time. All they now know about the machinist's trade they have learned at this factory.

The wages paid them were lower than the scale in large cities, but higher than they had ever received before. Moreover, these workmen live at home, have few expenses, no transportation costs, and in the long run probably have a higher actual wage than the city workmen. Practically all of them realize this, and for that reason continue to work where they are. Some few have succumbed to the lure of higher wages in the city. Most of them are back at work in Spencer, after their city experience.

And while this force of exceptional workmen was being developed, a spirit of factory loyalty and company pride was being built up with it. Although without competition for its labor, this management has never shown the least desire to take advantage of that fact. Its ideas and actions have been distinctly in the opposite direction.

The men have been given a square deal ever since the little plant began operations; new men coming in get that idea reflected from older workmen. Wages, hours and conditions are on the basis of an individual relationship between the company and the man, but the door of the manager's office is always open to any workman who desires to enter. Every provision is made for the workmen that they desire.

Might not their desires be unreasonable?

The experience of this firm—and of many others for that matter—has been that when this spirit of fair play is built up as a fundamental of relationships, the employees do not desire unreasonable things any more than the management desires to make them submit to other unreasonable things. Here is an interesting application of Roger Babson's theory that "for every action there is always an equal and opposite reaction."

One of the chief factors in enabling this company to build up such a relationship has been its location in the small town. At least, this is the conviction of its manager.

In a large city the industrial relations in any given plant must be affected by injustices which may be practiced by other manufacturers in the town. It is impossible for a single plant to be unaffected, even though it strive its best for isolation. Thus even though a particular manufacturer treats his men with utter fairness and honesty, he may have a high turnover because other manufacturers surrounding him do not do the same thing.

In a small town, on the other hand, a manufacturer and his men are in a position to work out their own salvation. Unjust practices in such a case would cause trouble as they do anywhere else, but the proper conduct of industrial relationships has a fair chance of working out according to its merits. This is borne out in the experience of the Spencer Metal Products Company.

So well has the management gained the confidence of its workers that it did not lose a man or have a "kick" when it explained to the men the necessity of cutting wages shortly after the signing of the armistice.

This cut was due to the necessity of **reducing prices to meet peace-time needs and conditions.** When the situation was explained to the men they readily acquiesced. **Since then wages have been increased,** as the company has become more successful and more prosperous. Thus the workmen have been given reason to know that their confidence is justly reposed in the management; they are sharing in the increased prosperity.

Another incident occurred some time ago, which illustrates in a striking manner how fully developed is the confidence between the management and the men.

A trouble-maker is always liable to get into any industrial Eden. Such a man came into the employ of this little company. He had practically been discharged twice, but had been taken back both times because of his family, which was badly in need of the financial support he could give them.

This man felt that he was not making enough at the machine job on which he was working, and asked to be transferred to the polishing department, where the rates were higher. He was warned that the work was less pleasant and that the higher rates were simply to compensate for the disagreeable nature of the work. He wanted the job anyhow, so was transferred.

Shortly after his transfer, he became discontented and succeeded in getting the other nine men in that department to say they would strike for a raise in rates. The meeting at which this decision was made was held at noon.

Before quitting time that night each of the nine men, except this ring-leader, came singly to the superintendent, told him what was about to occur, said they were satisfied personally with wages as they were, and asked him what to do about it. They were told to go through with the plan.

The next day, Friday, the ring-leader came to the manager and announced the strike. The manager said, "All right, don't let me stop you." Saturday all the men were absent from work. Monday morning nine of them returned. Finding himself deserted, the ring-leader came back a few days later, but was surprised to find that his job was not open for him.

The striking thing about this little story is that every man in the department, although having allowed himself to be swept into something that he did not desire, turned immediately to the management when looking for someone in whom to confide his trouble and difficulty.

And the management believes that this spirit has been built up because the plant is located in a small town and because the organization itself is small. Other lines are being added by this manufacturer, but he is establishing the plants in other small towns, believing in the small plant as a unit for manufacture.

Months go by at this plant when the labor turnover is nothing; it is ridiculously low for a year.

Some of the men live on farms some distance from the factory. Trucks are sent out for them each morning and take them home at night. New houses are being built in the town which will be sold at cost to the men, while an insurance plan and other benefits help to show them daily the interest of the management in their well-being.

What has been done at this plant in the handling of human relationships that has not been done at hundreds of other plants? In one sense nothing. Many other manufacturers have gone into the matter on a far more elaborate scale and have met with much less success. This factory, however, is typical of a number of small town plants which by means of a "square deal" and a peculiar manufacturing environment have made a distinct success of their industrial relations. For that reason the experience of such a plant is worth examining and discussing.

The New Worker

NEARLY every employment department makes a special effort of some sort to tie up new employees to the company. Labor turnover is always highest among those who have been employed less than two weeks. For this reason special attention is usually given recently hired employees. Such attention has the additional benefit of getting the new men started with the proper feeling of loyalty and goodwill to the concern. First impressions last longest.

Some methods of doing this have been described from time to time in AUTOMOTIVE INDUSTRIES. Another interesting practice along this line is in use at the Greenfield Tap & Die Corporation. It combines the welcoming of the new employee and the immediate instilling of the Safety idea.

One or two days after the employee has been hired the following letter is sent to him through the mail to his home:

> We take this opportunity to extend to you a welcome to our organization. It is our hope that your stay here will be lengthy, prosperous and free from injury. Whether or not it will be is largely up to you—did you know that?
>
> Being careful is a habit with us, and only careful workmen are welcome to remain here. Now that you are with us in person we want you here in spirit. Do your work with care, protecting yourself and your fellow worker, that we may all be able to enjoy Safety.
>
> Get the GTD habit of being careful—and enjoy happiness.
>
> Yours for safety,
> GREENFIELD TAP & DIE CORP.
> Industrial Relations Manager.

As a Central American Sees Truck Export Problem

This is rather a remarkable view of the duty of the American exporter toward a potential market of great possibilities. The writer, himself a truck user, tells exactly what is needed to foster the growth of the great automotive trade that is certain to develop in Central America.

By O. C. Gould*

WHEN the new governor of British Honduras assumed his duties a year ago he decreed that that roadless colony's half century of stagnation would have to yield at once to progress. He has the experts on the job now, men competent to provide creditable public works and able to promote in it a flourishing agriculture to use the new roads and bridges.

The premier industry, mahogany logging, needs roads to tap supplies now inaccessible, or soon the exports must decrease. The requirements of this industry are for roads back from the head of easy (or certain) navigation on the rivers, where logs are delivered to the water and supplies loaded for overland transport to camp. The premier industry to be, agriculture, demands the tapping of those fertile lands lying behind the broad belts of mangrove swamps and floodlands along various streams and the whole coast.

It is therefore probable that trunk lines will not be included in the road program of the next few years. Short, rather isolated roads, which later may be laterals for trunk roads as they are at first to be laterals for the waterways, will be built. This policy will keep the expenditure within practical limits. It will not demand more roads than there is labor available to construct. It will make the road investment profitable to the fullest extent at the earliest moment possible.

Roadless Country

British Honduras resembles most of Central America in being practically roadless. One can, to be sure, use motor vehicles in and for a few miles out from Belize, Corozal, Stann Creek and Punta Gorda, the last three being the centers of what little agriculture there is and Belize being the unloading and distributing point for the whole colony. The few pleasure cars now owned in the colony are in Belize and Corozal. There are a few American planters at Punta Gorda who can afford and should have both cars and trucks. Their road, like all those in the colony now, is not good but it is negotiable. The need for something better than ox-carts is indicated by hauling costs averaging a dollar per ton-mile, and horseback riding is a slow method of covering the four miles, or so, to town. Belize, barren of any facilities for handling freight for distribution, should have motor trucks in place of the small capacity two-wheeled carts now wholly employed. They are especially unsuited to the increasing number of heavy packages. Corozal joins with Toledo District in having several thousand tons of sugar to transport to the coast and a considerable amount of supplies to carry inland.

Much of the colony has no roads. What about field and trail requirements? Oxen cut up fields and trails horribly now as well as damage the roads. Nine months of the year soil and rain combine over almost all of the colony to make wheeled vehicles useless or almost hopelessly inefficient. What is needed at present is caterpillar traction (both engine and trailers), though this situation will be modified greatly as roads are provided and skill in making rainproof arteries is acquired.

A few tractors have been imported. These are solely for logging uses, for British Honduras is practically a logging reserve at present. It exports twice as much valuable cabinet woods (principally mahogany, Spanish cedar and rosewood) as all the rest of Central America. The yearly production of the colony is, roughly estimated, 30,000 logs of mahogany (three to the thousand feet), 3,000 logs of cedar (same) and 2,500 pieces of rosewood (eight to the ton), valued at nearly a million dollars. This works out at about $100 per thousand feet delivered at stream mouths.

The nature of tropical forests makes these woods expensive. Americans usually fail to visualize these forests correctly. Solid stands of any wood are uncommon in the tropics, though of course one finds many trees of the same species somewhat bunched in favoring localities. There is, however, no such thing as a forest of mahogany, or one in which cedar or rosewood constitute more than a very small percentage of the mixed stand. Land is rich in mahogany that averages one tree (say, 1,000 ft.) per acre, and the average is much lower. Perhaps British Honduras has a million mahoganies, large and small. That is pure guess. Nobody knows. The woods are too dense to make cruising practicable.

Trails from a quarter of a mile to a mile long have to be cut to get out a single tree or two or three. These roadways are mighty poor and very expensive in proportion to what is carried over them. Once used they are surrendered to "bush" and within a year or two, blocked by cutting grass and coppice, they cease even to be trails. There has been no effort to make such clearing of permanent account or to consolidate the hundreds of miles constructed each year.

An effort is made to get all logs to the stream banks by May. The rains begin then. Logs must be floated out during the floods, usually in June and July, and, of course, the woods speedily become soft once the rains have commenced. The use of all equipment, then, is seasonal, amounting to about three months in the year.

*A truck user in British Honduras.

This argues against expensive units. The diversion of trucks for other uses is made difficult by all other industries confining their transportation so far as possible to the same dry season. Those engaged in agriculture have the same seasonal demand though it is possible that cultivation of different crops might distribute transport over a larger part of the year.

Logs used to be skidded or rolled out by hand, and some are still where it would be relatively costly to place trucks and oxen or engines. The bulk of the work is now done by oxen. Probably most of the logs are skidded. However, many eight-wheeled trucks are used with varying degrees of satisfaction. In general the sentiment of the workers is unfavorable to trucks and among the contractors there is no unanimity. Only rarely is a contractor likely to truck all his logs all the way: sometimes skidding in the "wing passes" and trucking on the "main passes," and sometimes skidding all the way in part of the work and trucking all of the way in some other sector. Two-wheeled skidders and large wheeled carts (carrying logs suspended) such as are used in our southern states have been tried and abandoned. **So far as I can learn it was not because of lack of merit but, instead, from prejudice or ignorance of how to get results with them.**

This is quite a factor in the American tropics, the large part that happen-stance and prejudice play in the means employed. The contractor is rare who can, or does, get at the facts from an analytical angle, coldly surveying investment, depreciation, operation, seasonal service, distribution of everhead, possibility of doing by expedition what otherwise would be impossible, getting maximum hours of rolling service per diem out of prime mover, etc. Up north salesmen wake contractors and make them think, whatever they may be disposed to do, and a different sort of competition, likewise stimulating, is experienced. Here, for the most part, each contractor has his own bailiwick and he cuts or not according to whether he **thinks** the market price warrants. He hardly ever knows in advance as contractors in the States do.

That's why mahogany is a gamble and all major contractors are supposed to go broke if they stick to the business. Of course configuration of the ground often enters into the matter of employing trucks as does also the letting and reletting of the work to sub-contractors. Many of the major contractors are virtually subcontractors of American traders. This system encourages indifference to the methods of the man below, attention being focused on getting the logs at the price stipulated and passing all burdens on to the consumer. The salesman able to talk from the circumstances these contractors face would probably find them keen business men and anxious to be shown.

Truck Makers' Mistake

They do not fall for American advertising and sales-letters largely because they know the writers do not appreciate the conditions of this region. Performance of certain apparatus in the States is not conclusive proof of their suitability for British Honduras, though I've yet to hear from the truck manufacturer who does not think that because his make stood the gaff in Flanders it will stand anything. It is well for manufacturers to know that local merchants are not desirable representatives. To begin with, every one has varied interests, being "handy men" of trade, likely to mix his auto trade with cameras, dry goods and barreled pork. There is practically not a concern fitted to handle motor vehicle introduction, especially because there are no garages, capable machine shops or stocks of repair parts. Exclusive selling arrangements are to be carefully avoided. Cooperation should be resorted to and a competent representative from the States placed in charge of introducing a more or less varied line of machinery and implements. Only such men can bring to bear on local conditions the knowledge that will transform the obstacles of to-day into the sales arguments of to-morrow. The general merchants are not salesmen, in our conception of the term, and they most surely have not got the automotive viewpoint. There is more to the problem than chasing profits.

An argument in favor of using automotive equipment is that contractors to-day are cutting an average distance back from the streams much greater than heretofore. This distance will continue to increase, so economies must be effected to compete with other mahogany producing countries. As trucking is better than skidding for longer hauls, so also is the motor engine better than the ox. With the new roads contemplated, large areas will be attractive which now no contractor will invade. This will accelerate the natural tendency toward machine performance.

Except for the scattered location of the trees the writer's knowledge predisposes him against trucks. Wheeled tractors he believes equally unsuitable. They certainly are not adapted to rainy weather use except in scattered good patches or way back from the coast (with which region, aside from near El Cayo, no one is dealing now). They might get by in dry season with decreased efficiency.

Mahogany export could be greatly increased by the use of machines. The wood could be delivered so much cheaper than from other regions that British Honduras could underbid and regardless of the state of the market be sure of handling the maximum amount. Lower prices would also make for greater demand.

Railroads Hold Sway

The market for motor vehicles which agriculture will create and the part motor vehicles will play in developing agriculture is for American manufacturers to determine. The higher initial cost of automotive equipment will be a handicap and inertia will work against its introduction.

Central America is wedded to a fondness for railways. America's market for motor vehicles there depends upon knocking out this superstition decisively in the first round. We know from war times, in particular, that railways are inefficient for short hauls and especially for handling perishable or valuable farm products that ought not to be rehandled.

This is the stuff Central America will have to haul and Central America has nothing but short haul propositions anywhere. This is emphatically true of British Honduras. Roads are what is needed, letting every man use them according to his means. He may walk, go horseback, drive or motor. He may pack his load, carry it on a mule or by ox-cart, wagon, tractor, train or truck. Of course, given faith enough to build roads, sooner or later he will use motor vehicles.

Railways are favored because Central Americans do not understand making roads which will stand the rains and because of financial problems, roads of the ordinary sort giving no yearly money income with which to amortize investment. It is not to our interest or credit, as seekers of export trade, to connive at railway plundering of these peoples. It has been done, just like stealing candy from babies. Their desire to be up-to-date and business-like has been imposed upon to commit not highway but railway robbery. We have laughed at their

simpleness and pocketed coin that wisely spent would have made them much better customers to-day.

Why not copy from the Multigraph and say, "You cannot buy a railroad from us unless you need it," and give them the benefit of our costly experience. The solution of their problem is a task fit for co-operative effort by American vehicle makers, road material manufacturers, bridge builders, etc. We should get together and have an expert survey made of needs and possibilities. The labor available for construction and the financial limitations will prevent excessive construction.

We should show how to build and maintain the roads, and probably American contractors would be keen to bid on the work. We should see that the bonds are placed and, if necessary to get them to accept roads instead of rails, be ready to handle them as toll roads for long enough to break even or make a small profit. This sounds a bit unique and yet American manufacturers do most of these things, and many others, for possible customers in the States. If campaigns are necessary to convince the folks at home that good roads pay, should we be surprised that they are requisite in Central America? If more railways are built we will pay dearly for the choice. If roads are built we will profit handsomely.

Inertia says that motor fuel is scarce and expensive in British Honduras (as is, also, coal or oil for locomotives) and competent operators are rare. Quite true. Every one may not be able to handle automotive equipment well, just as few men make good mule or ox drivers. Vocational courses in handling could be given by associated American manufacturers and enough drivers and mechanics be trained.

Time and the wider use of motors will end the scarcity and high cost of motor fuels so far as they result from a poor system of distribution or from the spreading of overhead over a small volume of sales. The disproportion between production and demand for gasoline will be met by using industrial alcohol, I think. Central America can produce this cheaply and in large quantities. It could be arranged by co-operation, too, but will come anyway. So I venture the prediction that very soon the machines which will sell best will be those fitted to use this fuel.

Just now negotiations are reaching a conclusion for the establishment of a several million dollar sugar central on the estate I manage. The governor has said, "Turn your molasses into industrial alcohol, so we will not have to depend on outside sources for motor fuel, and we will reduce the excise tax to a nominal amount and make the restrictions as little annoying as possible." If this is done, and I am inclined to believe it will be, it will create a supply of comparatively cheap fuel sufficient for the colony until such a source of supply has increased the use of motor engines and vehicles.

Whatever may be true in neighboring republics, in British Honduras claims may be cheaply and quickly enforced at law. So far, then, as the handicap of high initial expense can be met in the United States by time-sales or the instalment plan, it can be met similarly in this colony. I need not say that there is somewhat greater need for caution in selecting those entrusted with such equipment, not because less honest but because generally more ignorant of how to use it.

Last but not least, you are asking yourself, is this potential market worth my attention? You must settle that. British Honduras looks smaller than a postage stamp on the maps, I know, but it's fairly big, richly endowed and its time has come. If you're especially interested in to-day, stay clear. If to-morrow is all important, don't let a map and the trade statistics of to-day fool you. Land prices are showing the trend clearly. Here is a colony the size of New Jersey with the soil of the Dakota black belt and with a fine climate.

Two-fifths of its 4,500,000 acres are estimated to be cohune ridge, the best sort of formation. Ten years from to-day British Honduras will be selling annually to Uncle Sam a billion dollars' worth, or about that, of cocoanuts, sugar and the like. It would seem that such a region is large and promising enough to cater to. It would seem that this is the time to prepare for its coming market. Moreover, what's to be learned in British Honduras will help mightily in selling to the neighboring countries where English is replaced by Espanol.

The Use of Motor Vehicles in Jugoslavia

THE roads in Serbia are in poor condition owing to heavy traffic and non-repair during the war. These roads formerly were hard surfaced and furnished the chief means of communication throughout the country. The topography of Serbia is mountainous and heavy grades are frequent. Such conditions militate in favor of light, high-powered cars. In the former Hungarian Provinces of the Banat, the Backa, and Baranja, and in Croatia and Slavonia, the country is level and the roads are inclined to be heavy during the winter rainy season; otherwise the roads are good. In Bosnia, Herzegovina, and in Montenegro the roads are hard surfaced and in comparatively good repair. The country, however, is mountainous and sharp inclines prevail. In Slovenia the roads are in good condition and the country is hilly.

It is estimated that 100 cars have been imported during the past year. Of these, at least three-fourths are of American origin and belong to the category of low-priced, high-powered cars. A conservative estimate places the number of passenger automobiles to be absorbed by this country in the next 12 months at 400. This is exclusive of cars for Government purposes.

Very high prices are being realized on both new and second-hand cars. American relief organizations which are closing up their work in Serbia have sold cars which have had several years' service at prices approximating the original costs. For instance, cars of certain American make were sold for 13,000 dinars at a time when $1 equalled 15 dinars. New American cars of the sedan type, brought into the country during the month of April, were sold for 70,000 dinars, and it is believed that they could be sold for that figure at the present time, despite the falling of the dollar on the local exchange since April. The Austrian Fiats, 5-passenger cars, are bringing about 100,000 dinars. The number of cars in actual use in this country in April, according to statistics obtained from the Ministry of Interior, follows: Automobiles, 1592; trucks, 274; motorcycles, 290. These figures do not include about 2000 passenger cars and trucks under the control of the Ministry of War, but do include civilian government cars.

There is a market for American cars in this country, but sales cannot be made through catalogues and by correspondence. It will be necessary for American exporters to secure a local agent who will be in a position to import cars and sell from his stocks. American automobiles are undoubtedly the most popular in the local market.

The FORUM

A Machine for Disposing of Snow by Melting It

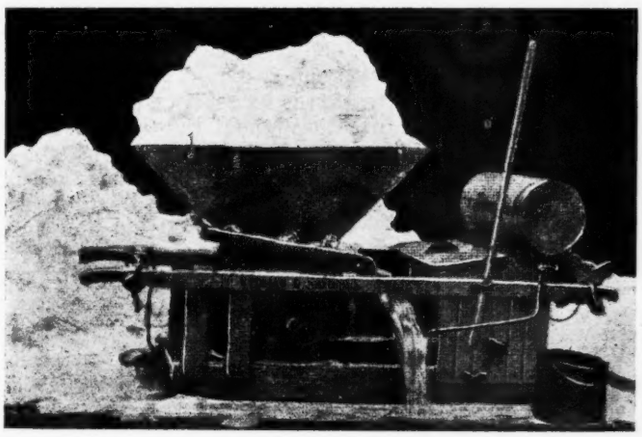
Editor AUTOMOTIVE INDUSTRIES:

AS a constant reader of your valued magazine, AUTOMOTIVE INDUSTRIES, I am taking the liberty of writing to you in regard to an editorial about the problem of *snow removal,* published in the issue of Sept. 30 of your magazine.

As the question of snow removal has come to be of such great importance, I am herewith sending you a catalog fully describing the "Fennia" snow melter, which is a practical solution to the question. This machine has been invented in Finland and is no longer in the experimental stage, as it has satisfactorily proven its efficiency in actual use during the last eight years. It is absolutely useless to cart the snow away when it can be melted on the spot at a great saving of both time and expense.

The melting capacity of the smallest size, as seen in the catalog, page 3, is 5-10 tons or 700-1400 cu. ft. per hr. The operating cost includes only the amount of fuel consumed, either coal or crude oil, an insignificant amount of electric current and the wages of the four men needed to operate the machine at full capacity. As this machine is of simple and ingenious construction, it could be manufactured in America at a very low figure, say about $150 each, actual production cost, which, compared to the cost of other machines, is small indeed.

The larger cities are no doubt in need of machines of greater capacity, and therefore there has been designed in Finland a larger machine which is self-propelling and is equipped with automatic snow elevators. Its capacity is 3500-5000 cu. ft. per hr., and even more if the snow is in soft and flaky condition, and the cost of melting would be smaller than with the normal type described above. This machine is equipped with a 15-20-hp. gasoline motor, directly coupled to an electric generator, which generates current for two motors. One of these motors drives the snow elevator and propels the machine, while the other one drives the high speed blower the same as in the smaller type. This type would be suitable for manufacture by some truck-producing company, as many truck parts could be used in its construction. ILMARI RAINESALO.



Fennia snow melter

(The Fennia snow melter consists of a welded furnace of sheet-iron, water-jacketed all around to prevent damage through overheating and to minimize radiation of heat. A water-cooled cover, with suitable openings for the even distribution of the heated air and combustion gases, tops the furnace. A removable snow receptacle surrounds this cover and the upper part of the furnace, to the outside of which is secured a system of ducts for collecting and expelling the water, sand and dirt. A high-speed blower, suitably housed, and driven by a small electric motor or gasoline engine, creates a strong current of air directed into the furnace, causing a brisk combustion. The hot air and gases are driven straight through the snow, causing it to melt at a rapid rate, the air and gases finally issuing practically cool after their passage through the snow. No smoke is noticeable, it is said. A simple cooling system is incorporated, consisting of a tank in which part of the melting water is led through a self-cleaning strainer, a non-freezing centrifugal pump, submerged in this tank and driven by the motor, a non-return feed pipe to the waterjacket of the furnace and a row of openings in the top of this, through which the heated cooling water is squirted into the snow, assisting the melting. To convey the current needed for the electric motor the apparatus is equipped with 300-600 ft. of cable on a cable reel. It has been found in practice that this way of obtaining the requisite power to drive the blower is by far the simplest.

The whole melting apparatus is mounted on runners with handles. It can of course be made to run on wheels if desired. The smallest model, with a 1-hp. motor and weighing 6 cwt., requires four men to shovel in the snow and melts 5-10 tons (700-1400 cu. ft.) of snow per hour. The upper limit is attained with hard coal or kerosene.—Editor.)

Standardization of Differentials

Editor AUTOMOTIVE INDUSTRIES:

THERE appeared in the issue of Sept. 2 of AUTOMOTIVE INDUSTRIES a few paragraphs relating to the standardization of differentials.

We, as builders of automobile axles, have many times wished that some such standard existed and we can fully appreciate what steps of this kind would mean to the axle builders. We are prepared to do our share to furnishing such data as may be required and will work in harmony with any steps that are taken toward the establishment of the standard referred to above.

K. F. RAUSCH,
Secretary, Peru Auto Parts Mfg. Co.

Peru, Ind.

A FRENCH contemporary gives the following definition of a cycle car (a species extinct in this country but quite alive abroad): "Four bicycle wheels, a motorcycle engine, a length of sewing machine belting and a garden seat."

Gaining Workman Cooperation Through Efficient Wage Regulation

The practical methods of a British employer in establishing an effective rate-setting department are described in this timely article. Mr. Northcott points out the necessity of making the square-deal idea concrete and explains the details of the system used to accomplish this in one large plant.

By Clarence H. Northcott

A SQUARE deal has the same meaning and "pull," the same challenge to the sense of justice and the spirit of fairness, wherever the English language is spoken. Men may differ widely in opinions, but will readily co-operate in practical efforts to secure adequate remuneration and proper working conditions. And industry requires this co-operation to-day, if it is to survive in its present form or in any form different from the economic anarchism of Bolshevism.

For the present economic system has to sustain the onus of disproof of serious charges. It is regarded by millions of workers as fundamentally unjust. Its past record is tainted. It has been one-sided and autocratic in administration, and governed in the distribution of its benefits by the principle: "To him that hath shall be given, and from him that hath not shall be taken even that which he seemeth to have." A very large majority of the workers in civilized countries are persuaded that they cannot get justice from it. It exists, they say, to reward certain fortunate persons and to increase their fortunes, while keeping the workers down on the iron level of subsistence. The efforts of the latter to draw a larger share of the product of industry cannot be successful till they have complete control of industry.

But the day when the workers can contribute sufficient to merit a share in the full control and direction of industry is at least a generation distant. Much water must flow under the educational bridge before such a result becomes possible. It is not desirable to wait for the leavening influences of education to do their work. The very appearance of injustice must be removed, so far as possible. Autocratic management must give place to co-operation. Reward must be adjusted to merit, infinite care being bestowed upon the individual as well as upon the group of workers. Grievances, which, though petty at first, may increase till they become a flood, must be canalized and drawn off into fruitful fields of co-operation. Effort must be prompted by taking away, so far as possible, the two bugbears that haunt the workers, the fear of unemployment and of the cutting of piece rates. In a word, the square deal must not merely be promised, but organization effected for securing it.

One of England's best known employers has during the last year made several important contributions to the establishment of the square deal. He is engaged in an industry which works under a national agreement. In this agreement, a whole week's holiday is given and paid for, in addition to six other public holidays. Men who work on alternate day and night shifts receive an additional 12½ per cent in wages as compensation for the personal and domestic inconveniences involved in the shift system, while permanent night workers receive 16 per cent bonus. The trade covered by this agreement is one the output of which is affected by hot weather, so that on hot days it is more economic to send the workers home. But if such hot weather or the breakdown of machinery, or other causes over which the workers have no control, compels a stoppage of work, each person is to receive the equivalent of unemployment pay. Further, piece-workers are guaranteed rates which will yield workers of average ability earnings at least 25 per cent above the basic rates for time-workers. To ascertain whether this guarantee has been kept, it has been agreed with the trade unions that the earnings of all piece-workers employed on the same series of process shall be averaged over a quarter, and the rates shall be considered right if this average agrees with, or exceeds, the 25 per cent advance on the time rates.

To make certain that this forward-looking agreement, for which he was largely responsible, should be carried out in his establishment in the spirit as well as the letter, the employer in question set up what he describes as a wages section within his labor department. It is not the business of this section to pay wages, but to advise on wage policies and to carry out those policies, when agreed on by the board of directors. As head of the section there was selected a man trained as an economist and statistician, who had made a careful study of wage matters and trade union policies and had been for many years in close contact with workers. An assistant statistician and the necessary clerical force were attached to the section.

Three major matters receive the chief attention of this wages section. In the first place, all individual claims for higher wages and all payments and advances accruing on any ground have to be attended to. It is the aim of this section to seek to deal with such rightful claims before ever they have been made, or, when they have been made, to deal with them promptly and justly. To secure justice in these advances, information is necessary concerning the rates of pay and earnings throughout the whole mill, as well as knowledge of rates current in other industries throughout the country. For this, the statistical side of the section is held responsible, and has a card catalog for all time workers. At regular intervals questionnaires are sent out to fellow employers in many industries to obtain the most recent rates and the replies are carefully collected. By examination of individual claims and comparison with the rates for the same type of responsibility in other sections, justice can be done, and merit receive its due award. By comparison of groups of workers with similar workers in other establishments, the wages section can be as sure as circumstances permit that the rates they pay are as fair as can be devised.

The second duty of the wages section is to adjust reward to effort in the case of groups of workers, exclusive of piece workers. This involves the installation of bonus systems. Fortunately, this establishment is in a center where the well-known British dislike to "payment by results" has not established itself. Wherever, therefore, a piece rate system seems to be practicable to the workers they are sure to ask for it. In general, the administration has established piece rates wherever the conditions made such a system desirable and economic, so that the first task of the wages section, when a demand is made, under such circumstances, is to put the management's case before the workers, and its second task to find some other means of adjusting reward to effort. This is done usually by some form of collective bonus or output, sometimes by a direct advance in time wages, where a comparison between the day workers presenting the demand and piece workers seems to justify such an increase. The principle adopted in such circumstances is that workers shall be recompensed at a higher rate for increased effort. The result has been greater content and no increase in the work staff whenever a larger amount of effort is demanded.

In respect of piece workers the responsibility of the wages section resolves itself into the question of whether the rates are fair. The statistical branch keeps track of the average weekly earnings of sections of piece workers. If these are found to be below the guaranteed minimum, the rates are examined, and all related factors of efficiency and production investigated. If seasonal causes are held responsible for the deficit, the rates will be left alone, but the guarantee will be observed by a payment at the end of the quarter to all piece workers, equivalent to a percentage on the piece rates sufficient to yield the 25 per cent advance on time rates. Should the rates be unsatisfactory because some are high and others too low, the wages section, in collaboration with the management and the workers, seeks a satisfactory rate.

These functions, as suggested, involve frequent conferences with directors and managers, and negotiations and conferences with groups of workers. They do not, however, comprise contact with individual workers or reception of their grievances. The latter has been the prerogative of the managers and foremen of the various sections, with the right on the part of the workers to go to the head of the employment section. Even with all the measures taken to secure a fair deal, it was quite possible for an equitable claim to be caught in the cogs of the administrative machine or for a manager who honestly thought himself in the right to resist a just demand for an altered piece rate. To avoid the first of these difficulties especially, and to secure the wages section the advantage of the workers' point of view in a question of the latter kind, the firm in question decided to attach a direct workers' representative to their employment section.

For the position they chose the man who held the position of vice-chairman, that is, the workers' chairman, on the firm's Central Works Council. No one better fitted for the post could have been appointed. He is a man of sound judgment and broad outlook, who has served his constituency well and, being apparently without any sense of class consciousness, is likely to serve them better with wider opportunities for doing so. He is thoroughly trusted by his fellows, and highly respected by the administrative staff.

Though his appointment is quite recent, he has helped to unravel several inequities the existence of which in so large a plant was unsuspected, and has been able to keep men at work by promising to bring their grievances promptly before the proper authorities. While paid by the firm, he is the workers' man, just as a check weighman in a coal mine is the agent of the men.

This story shows that a square deal must be organized to become actual. The desire of the manufacturer to meet his men face to face is not sufficient to insure justice. Truth is often to be found at the bottom of a well, and someone is needed to bring it up to the surface. A busy executive, even if he could find time to interview all his men with grievances, would not be able to get to the root of their grievances. He must, therefore, set up a small organization to sift grievances, to get at the facts of a just wage system, and to pay proper rates. In the case in point, this organization has been seconded by the addition of a workers' representatives, whose efforts, advice and influence are at the disposal of both management and workers, and count greatly toward the firm's endeavor to secure a square deal.

Preparations

AT a meeting of an association of a certain group of automotive manufacturers recently, a letter was read which had been sent by union headquarters to every member of a union strongly represented in the plants of these manufacturers. That letter reviewed the general condition of the automobile industry, stated that the present was a poor time to attempt to raise wages or reduce hours, because the economic advantage was "with the bosses," and finally included this paragraph:

"This is not the time to listen to anyone who advocates hasty, intemperate, or ill-considered action; it is the time for the display of good generalship, for the factories will not be laying off workers forever, or be slack all the time. *They will get busy one of these days and when they do we must be ready to repair any damage done.*"

When this sentence had been read a leading manufacturer remarked, "And God help them when they do."

The incident calls forth several interesting thoughts. In the first place, the remark of the manufacturer is the natural immediate reaction of any red-blooded American to the challenge implied in the union letter. The opposing forces are biding their time and marshaling their forces for future action at a more favorable time. Such an attitude on the part of the workmen very naturally calls forth the courageous answer of a strong man, "We will be ready for the fight and we will beat you." The American manufacturer is not wanting in courage; it is that courage which has built our industry the big and fine proportions which it now comprises.

Despite the present lull in industrial troubles, this incident would indicate that both sides are ready to lock horns as soon as conditions change. What will it mean to the manufacturer if he does fight and does win another temporary victory?

The manufacturer has nothing to gain from industrial warfare, whether that warfare is thrust upon him by the belligerency of certain groups of workers or whether he invites it himself through ineffective personnel methods. With this fact in mind, it becomes evident that the essential need is an analysis of those factors which go to produce the belligerent attitude of some workers, and a devising of means by which that attitude can be changed. Courage and fighting ability will not suffice.

Admitting that the workers in this case are entirely wrong, the manufacturers are likely to lose more than they gain by fighting and winning; and in this instance a resumption of industrial war seems certain as soon as conditions change.

An Example of Putting Friendliness Into a Unionized Shop

In this article, Mr. Tipper quotes from an English employer to show that the open shop is not necessary to reach your employee in the matter of a square deal and friendship. English plants, we all know, are thoroughly organized and the unions there are more jealous than in this country.

By Harry Tipper

WHEREVER experiments have been made which indicate that employers are reaching out for means to better the relations of the owner, the management and the workers, it is worth while to record such experiments and to indicate the conditions under which they have been tried.

From time to time employers who are concerned in industries which are highly organized have indicated the difficulties which they foresaw in establishing new machinery for industrial relations within their own plants, because of the union attitude upon such matters, **and it has been considered that the open shop was necessary to the success of any such scheme.**

> **It is obvious that if the open shop is conducted with a due regard for the other fellow, and a square deal between employer and employees in all which that means, it is the most valuable way of unifying the industrial establishment and arriving at a complete accord between the workers, and the management, and the owner. Under the present conditions, however, this is not possible in all cases.**

There are many establishments which are so highly organized that an attempt to establish an open shop cannot be made at this time, and it is not wise that such an attempt be made. If the attempt were made, it would be regarded as the coercion of labor instead of an intelligent endeavor to establish the right relations.

In such shops, the difficulty of establishing new machinery for the education, the self-expression and the development of the worker is a more severe one, and many manufacturers conceive it to be impossible.

We are all aware of the fact that labor in Great Britain is thoroughly organized. The newspapers are full of the efforts of organized labor to secure political power and the big effects which their organization discipline can produce.

A British Experiment

Any successful experiment in the establishment of new relations between employer and employees in Great Britain is of particular interest, because of the complete organization of labor and the jealousy of labor regarding its privileges and rights. For this reason we are quoting the results obtained by A. C. Penman of Dunfries, Scotland, one of the oldest motor-body builders in that country, a man who is esteemed very highly in his locality, is a magistrate and a very prominent business man in the automotive field.

These particulars were contained in his address to the Institute of British Carriage and Automobile Manufacturers, of which he is president, and a quotation taken directly from that speech follows:

"All this may seem very stupid to us, but remember it is very much easier for us to see these facts than for the workers. These truths are driven into us in the daily conduct of our business by our losses and gains. But our workmen do not look so far ahead. A weekly wage does not encourage long views. Less than a month's unemployment would bring most of them face to face with starvation, and with the fear of unemployment before them, and not understanding that the only cure for the coming slackness is cheaper production, it is little wonder if they are a little afraid of working themselves out of a job.

They Have Lost Faith

"Then there is one other thing—they have lost faith in their employers. I know that it is not so in every case, but in the broad sense I am afraid it is so. The employers shout for production and the men are suspicious that it is only a trick to work them harder. The employers ask for diluted labor or unskilled labor, and again the men are suspicious that they are going to be done out of their jobs. Those of you who have served on the Industrial Council will remember how their representatives sometimes haggled for hours over a word, or a phrase, perfectly innocent in itself, but they were consumed with suspicion that somehow we were getting the better of them.

"The result of all this is that without regard to employers, or public, or even the future of the industry, now that they have their chance the workmen are out to get every penny. If we are in the peculiar position of being able to choose our workmen, they, much more, are in the favorable position of being able to choose between a dozen employers.

"They never had such an opportunity before, and it would be more than human if they did not make what to them seems the most of it. At the moment it is war to the knife when we can least afford it, strikes and lockouts when the whole world is waiting for our work, limitations of output as a deliberate policy when nothing but increased output can save us. It seems to me that the wage system, unmodified, is indeed on the point of breaking down.

"Now we have to find a way out. The world rolls on, and outworn systems have been modified or scrapped altogether before this, and will be again. 'There are nine and thirty ways of making tribal lays, and every blessed one of them is "right," ' so if men won't work for a fixed weekly wage, then we have to find out some other method

of dividing up the profits of industry for which they will work.

"A manufacturer was once showing Robert Owen over his works, and he remarked that £1,000 a year was lost through carelessness and want of good-will on the part of the men. 'Then why on earth don't you pay them £500 a year to save it?' That surely sounds like common sense. If the men won't work for us, is it not possible to get them to work with us, for work we all must under some system, or starve?

"It was some such thoughts as these that many years ago first turned my attention to this problem. My first attempt was to found a Works Savings Bank guaranteeing 5 per cent with a bonus above this according to the profits of the business to be fixed by the auditor. This was only a very modified success. Some individual men ran up to £100 but the majority did nothing and others were constantly withdrawing. The prospect of an extra dividend at the end of the year was too remote and too small to have any influence on output. I saw that something offering a much larger and a much more immediate return was required.

"Then my attention was turned to a bonus system which promised a greater and an immediate reward. The men were not very keen on it, but I discussed it thoroughly with them, and showed them that the standard wages would be paid in all cases so they could not be worse, and might be a great deal better. Finally they agreed to give it a trial and some prices were fixed, and a start was made. It worked like a patent medicine. Twenty per cent was about the lowest bonus earned and it sometimes ran to 50 per cent. Soon every one wanted to be put on bonus, and it was extended throughout the works as we found possible. There was no more need of supervision. They supervised themselves and worked to each other's hands. Goodwill and mutual helpfulness increased, and above all, quicker methods of doing the work and simpler methods of construction were continually being discovered, and at the end of the year the prices of several bodies were voluntarily reduced because they had been fixed too high for the new methods of doing the work. It paid me, for I got the output and saved the oncost and the supervision, and it paid the men. I do not know that they worked much harder, but they worked much more intelligently and steadily and more as a team, and of course earned good wages. We were all quite happy before the war, and the only trouble was when some man made too much money, and a Union official would come down and persuade him to take it a little easier.

"The scheme was adopted in a modified way to our war work, and when we returned to our ordinary work I proceeded to develop it further, and to bring everyone from the managers to the apprentices into the scheme. I laid the scheme first before the men at the Annual Supper, and it has been discussed and rediscussed with their representatives since, and the following will be something like its final shape:—

Profit Sharing Scheme

"First Bonus—At the beginning of each year the different types of bodies we propose to build are discussed with the workmen concerned, and a price for each is fixed by mutual agreement. These prices stand for twelve months, but rise or fall on a percentage ratio as the wages may vary. After twelve months the prices are again brought up for consideration. If it has been clearly shown that some prices are too high or too low these are adjusted and any labor saving device introduced during the year, or any modification of design, are allowed for in the new prices. The new prices are of course again subject to a rise or fall according to wages. If a specialty is ordered during the year the job is discussed with the workmen concerned and a price fixed by mutual agreement. No alterations in price are made except by mutual consent. We reserve the right to fix the price of any new type without consent if an agreement cannot be reached.

"Second Profit Sharing—The first charge on the net profits is a dividend of 10 per cent on capital. After this is paid the surplus net profits are divided into three equal sums—one-third to increase the dividend in capital, one-third goes as a bonus to management in proportion to the rates of salaries, and one-third goes to labor divided as follows:—

"A percentage is paid on all wages which do not participate in bonus prices. Should the sum be sufficient to pay more than 15 per cent on these wages, then the surplus is divided in the same way over all wages whether participated in bonus or not.

"Two workmen who have been for ten years in the employment of the firm may be nominated by the Managing Directors and elected Directors. Workmen of over two years' service may become shareholders up to a total of £10,000 ($50,000), and these shareholders can take part in the discussion of policy at the shareholders' meetings. A Shop Committee forms the link between Managing Directors and the workmen.

"I know I will be told, if not here, at least outside, that the scheme is neither fish, flesh, nor good red herring, that it is neither wages nor bonus, nor profit sharing, but a mixture of all three with co-partnership thrown in. That is quite true, but what does it matter. There is no royal road out of our present trouble. There is no ready-made panacea which like a patent medicine will cure everything. The only question to ask of a scheme is, does it work? My scheme will not suit you, without several modifications. Your men are different, your conditions are different, your work may be different. Every employee must, I think, to a great extent find his own solution in conference with his employers. It is no use trying to thrust a scheme on them no matter how well meant. They will think it is for your advantage, not theirs, but if you can hammer out some scheme with them I think you would find, as I have found, that it is possible to get them to work with you, when they won't work for you. Experiment is what we want, for the world won't stand still and the present system has become intolerable."

Co-operative Societies in Russia

As numerous manufacturers are looking forward to trade in the Russian and Baltic states when conditions again approach normal, a recent official British trade report which is forwarded by the Bureau of Foreign and Domestic Commerce is of interest. The report concerns the co-operative society movement in Lithuania, showing that prior to the war some 300 of these societies had been organized. The Germans established similar organizations during the period of occupation but failing to win confidence, the old societies apparently are returning to life.

These societies, with a membership now of some 120,000 Lithuanians, are classed into five leagues, according to districts, which are Kovno, Shavli, Ponieviez, Vilkobishki, and Kedany. A special bureau, called the Bureau of Lithuanian Co-operative Leagues, has been organized for general buying and representation. The capital turnover for all districts for 1919 was placed at 44,000,000 marks and 11,000,000 marks during the first three months of 1920.

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Study the Market

BECAUSE of the very conspicuous and deserved success of certain types of trucks which may be called speed vehicles, truck manufacturers are apt to make the mistake of rushing headlong into this market without making a careful study of its demand. This vehicle has a very well defined, but nevertheless broad field and there is a tremendous market for this type of truck, but there is not a field sufficiently broad that many truck manufacturers can get into this business, exclusive of other types of truck design. There has been a marked tendency on the part of many manufacturers, now that the truck business is in the midst of a very decided lull, to drop everything and get into this line of business without a carefully worked out design, and a very capable distributing organization. Those who are doing so are tempting fortune without a great chance of success.

A vehicle to be suited to this field must be designed for it from stem to stern. It is impossible to take a passenger car chassis, strengthen its frame and increase its tire size and make it a speed truck. It is also impossible to take a light, solid tired truck, put pneumatics upon it and produce the results. The design must be worked out from the ground up with engine, transmission and rear axle particularly suited for the service to be rendered. The motor must be capable of carrying the load and giving the desired acceleration through a well selected set of gear reductions. The vehicle must be very carefully balanced throughout and in short, must be an engineering job from the ground up, and not a makeshift, hurriedly assembled to meet a condition of the market.

Before any truck manufacturer commits himself to a building program of this type of unit, if he desires to make a permanent or even a temporary success, he should be thoroughly convinced that he has a real suitable engineering job, and a good distributing and service organization.

Small Displacement Cars for Overseas

AT the present time there is a considerable foreign demand for a car considerably smaller than the smallest now in large production in this country—a machine of the cycle car type. Requests for names of American manufacturers of such machines come to us frequently from foreign dealers (mainly dealers in Great Britain and the British colonies), who undoubtedly are familiar with the demand in their own territories.

As far as the American market is concerned, experience has been that these very small cars could not exist in competition with the Ford. The Brush runabout was a practical little machine, with a single cylinder engine of only 63 cu. in. piston displacement as compared with the Ford's 177. But when the price of the Ford came down to near that of the Brush, it seems that people no longer wanted the latter, for the Ford naturally was very much faster on hills and generally more flexible. The four cylinder engine, moreover, was less sensitive; in other words, it didn't have to be in the pink of condition to give satisfactory service. The only inducement to buy the smaller car was lower first cost; everything else was against it.

Abroad to-day there are two important factors creating a tendency toward smaller cars. The first is the exceedingly high cost of fuel. With gasoline at $2.25 a gallon, as reported by our French correspondent a short time ago, people are bound to attach the highest importance to fuel economy, and small cars with small engines naturally are the most economical from a fuel consumption standpoint. The other factor is the horsepower tax. All of the late belligerent countries have been compelled to raise their tax schedules, and automobiles have fared particularly badly in this revision, on the principle that the man who can afford to own an automobile can afford to pay taxes. The tax is always based on a horsepower formula and is proportional to the piston displacement, hence the car with a small engine pays less tax.

There is such an insistent demand for small busi-

ness runabouts of about 100 cu. in. piston displacement and a substandard tread that American manufacturers can hardly afford to ignore it. Evidently, at least three forward speeds would be required, and four would be preferred. A foreign market for such cars would be assured, on account of the saving in fuel cost and taxes which they would permit of, and possibly there would also be a small market for such machines in this country among people who are looking for fuel economy. In seeking to extend our foreign automobile business this phase of the foreign market certainly deserves careful consideration.

Isolated Lighting Plant Voltages

AT the recent Metropolitan Section meeting devoted to the discussion of farm lighting plants, the question was raised why a voltage of 32 was so widely used in these plants, when appliances designed for use on 110 volt circuits were much more readily obtainable on the market. The reason for the use of a lower voltage than 110—which is practically standard in central station lighting—is very simple, and consists in a desire to cut down the battery cost, which for small watt-hour capacities grows rather rapidly with the number of cells. Even after this explanation, however, it may seem puzzling why designers went to this extremely low voltage, instead of to 55, one half of the standard house lighting voltage.

The 32 volt standard was taken over from railroad lighting practice. In this latter field higher voltages were originally experimented with, but were given up in favor of the 32 volt standard. In this case, too, the lower cost of a low voltage battery is a factor, but probably the main reason for the adoption of the low voltage was its effect on the life of lamp filaments. With an incandescent lamp of given candle power, the lower the voltage the shorter and thicker (and hence the more substantial) will be the filament. In railway lighting the filaments are subjected to considerable strain owing to the constant vibration, and the low voltage therefore offers an appreciable advantage.

In isolated lighting plants the advantage of the low voltage decreases with an increase in the size of the plants, and it is quite likely that in the future most plants of more than 1 kw. output will be designed for 110 volts. There seems to be a tendency, moreover, toward these larger plants, because once the farmer has a source of electric current on his premises he soon finds so many applications for electric power and electric heat that the small generating plant no longer suffices.

Cantilever Springs and Hotchkiss Drive

THE question is occasionally asked whether it is impossible to use the Hotchkiss drive in combination with cantilever springs. It seems that at the present time no cars or trucks are being manufactured embodying this combination, and in view of the comparative popularity of both features individually, it is obvious that there is some important obstacle to their combination.

In the Hotchkiss drive the springs are subjected to triple stresses. In the first place, they must support the weight of the chassis and load, which is their normal function; then they must transmit the driving thrust or the push from the rear axle to the frame, and finally they must take up the torque reaction which tends to cause the axle housing to rotate in the direction opposite to that in which the wheels revolve. It is this latter force which is very severe on cantilever springs and which accounts for the apparent impracticability of the combination. In taking up the torque reaction the spring acts as a single armed lever, and the bending moment on it varies directly as the distance from the center of the axle. But the point of attachment to the axle is precisely the weakest point of a cantilever spring, for only one or at most two leaves extend as far as the axle. The entire torque reaction therefore must be taken up on this one or two leaves, and it is easily conceivable that a single leaf or two leaves cannot withstand such stresses, which under certain conditions add to the stress due to the weight on the spring.

With half elliptic springs the conditions are entirely different, as here the torque reaction acts at the center of the spring and the stress is divided between all of the leaves to one side of the center. The strength of the spring with respect to torsional forces of this kind is directly proportional to the number of leaves, and as rear springs generally have at least seven leaves, it will readily be seen that there is a great difference between the cantilever and half elliptic in this respect.

There may be possible methods of overcoming this deficiency of the cantilever type of spring, as, for instance, by adding short leaves to the under side of the main leaf, but inasmuch as this removes what is perhaps the chief advantage of the cantilever springs, viz., low unsprung weight, it is hardly practical.

The Industry in Germany

IN last week's issue of AUTOMOTIVE INDUSTRIES there appeared a short item on the present state of the industry in Germany, written by W. F. Bradley, European correspondent for this publication. This item was merely a summary of Mr. Bradley's conclusions on his return from Germany and he is engaged in writing a much more elaborate study of the automotive conditions in the former German Empire. These articles will be printed in AUTOMOTIVE INDUSTRIES just as soon as Mr. Bradley can compile his information in his usual entertaining and instructive form. These articles should be of much value to those manufacturers who will within the next few years meet Germany as a competitor in the world's markets.

LET us not forget that Nov. 11 to 25 is the period for the annual renewal of Red Cross membership and pledges. The Red Cross is doing a wonderful work and its support must not cease merely because the war is ended. It is a peace-time organization.

DealersFindUpwardBusinessTrend

New Signs of Life Spur Sales Efforts

Unbiased Survey of Country Shows Renewed Interest in Automobiles

(By JAMES DALTON)

NEW YORK, Oct. 25—Straws point the wind and it is equally true trade zephyrs usually presage the trend of events in industry. Accepting this statement as true it can be asserted positively that there are signs of renewed life in the automobile business. This does not mean that factories are going to be swamped with a flood of orders but it does mean that manufacturers can hope to escape safely from the uncharted wastes they have been navigating for the past few weeks.

Just as dealers and distributers were the first to feel the slump in business which has just now reached flood tide in Detroit, they are the first to note a revival of interest in the motor car. Correspondents of AUTOMOTIVE INDUSTRIES in twenty of the most important distribution centers were asked to make a careful, cold-blooded, unbiased analysis of the situation to determine the general tone of the market. They were instructed to disregard extravagant claims of dealers who might feel it was "good business" to talk big and to stick religiously to facts.

Fourteen of these correspondents reported improvement in the situation. The cities represented in this roll of honor were Philadelphia, Milwaukee, Portland, Ore., Salt Lake City, Denver, Minneapolis, Atlanta, Boston, St. Louis, Dallas, San Francisco, New Orleans, Indianapolis and Columbus. New York also goes in this class.

Five Cities Holding Own

In five cities it was found that business was holding its own, but that the situation had not improved. These were Des Moines, Louisville, Omaha, Buffalo and Chicago.

In only one city of the score covered had business taken a turn for the worse and that was Cleveland.

Intensive, aggressive sales efforts have been largely responsible for the improved business. This is disclosed by analysis of the reports. Another factor has been the abundant harvest in the great agricultural districts. It must not be assumed that there has been a great increase in sales. The better showing has been relative as compared with the preceding weeks. It is probable the upward trend has been more noticeable in Philadelphia than in any of the larger cities. This can be attributed only to sales efforts for there has been no marked improvement in general business conditions.

BUSINESS is improving in these cities:

New York, Philadelphia, Milwaukee, Portland, Ore., Salt Lake City, Denver, Minneapolis, Atlanta, Boston, St. Louis, Dallas, San Francisco, New Orleans, Indianapolis and Columbus.

Business is holding its own in these cities:

Chicago, Des Moines, Louisville, Omaha and Buffalo.

Business has slumped in Cleveland.

Milwaukee sales thus far in October almost equal those for the same month a year ago while there were comparative losses in September. The greatest problem there is to get small town dealers to take their coats off and go to work. They seem to have grown lethargic during their period of unprecedented prosperity.

Conditions on the Pacific Coast are improving. Portland reports that demand is slowly picking up. Sales are not yet normal, or even good, but cars are moving. Dealers in that city expect slow but steady progress. The situation is not normal in the San Francisco territory but distributers are hopeful for the first time since the break in the market.

Sales Encourage West

Salt Lake City and Denver are encouraged. In the Utah city the past month has brought increased sales, especially of high priced cars. This has been due in large measure to bumper crops in the Utah valley and the valleys of southern Idaho. Sales in Denver are a trifle better and undoubtedly will increase when farmers get the first installment of their pay for beet sugar crops about Nov. 15.

New interest has been shown in automobiles in the Minneapolis territory. Most of the business has come, however, from prospects who have been hanging on until dealers could get money to finance them. Tight money has had a serious effect on business in Minneapolis as it has in Des Moines, where there has been no improvement and none is expected before the first of the year. Falling crop prices have deterred Iowa farmers from buying. Price reductions have stimulated passenger car sales in Omaha Business in other lines is about as usual.

Conditions in the South as a whole are improving. Demand for medium priced cars is steadily increasing in Louisiana, Mississippi, Alabama and eastern Texas. An even better showing has been made

(*Continued on page* 890)

Dodge Gets Behind Big Sales Campaign

Factory Launches Aggressive Move to Create Demand—Will Increase Output

DETROIT, Oct. 25—More than 4000 dealers from every section of the country, representing the Dodge Bros. distributer organization, will have visited the factory during the next three weeks for conference with General Sales Manager C. W. Matheson and to outline plans for an intensive sales campaign. The conferences began last week, when about 250 dealers were present, and will continue daily until every Dodge dealer has visited the factory.

The psychological effect of having the dealers come to Detroit to inspect the factory and see 625 cars being turned out each day in the opinion of Dodge executives will have a tendency to minimize the efforts of the calamity propagandists who sense panic in the temporary lull. The big expansion program undertaken at the Dodge plant, with new buildings being erected involving an outlay of approximately $7,000,000, was not lost sight of in the desire to stimulate enthusiasm among dealers by giving them opportunity to witness the speed-up program.

Chief among the plans which resulted in the call for the conferences was the decision to inaugurate a sales drive that will create demand and not permit dealers and their salesmen to relax their efforts through the influence of pessimists who take the position that "nothing can be sold under present conditions." The addition of salesmen in every dealer organization and vigorous efforts to create a market are being urged by Matheson, who is impressing on dealers that the time has passed when the business would come without effort.

The Dodge plant still is far behind with orders and despite the slump, which has affected many plants the demand for Dodge cars, Matheson says, is steady and sufficient to keep the plant operating at capacity. In fact, according to officials, efforts to increase production to 700 cars each day are being made with full confidence and from dealer reports the constantly increasing market will absorb the output as rapidly as shipments can be made.

TRUCK EXPORT OFFICE OPENS

KALAMAZOO, MICH., Oct. 22—Kalamazoo Motors Corp., manufacturer of Kalamazoo trucks, has opened an export department at 52 Wall Street, New York. James Zobian will have charge of foreign distribution.

Industry Important, Says Wellborn

Credits for Sales of Right Character

Restrictions Necessary to Discourage Extravagant and Impecunious Car Buyers

ATLANTA, Oct. 23—Governor M. B. Wellborn, head of the Federal Reserve Bank of Atlanta, in an address before the dealer-banker convention of the Georgia Automotive Dealers Association, held at the Capital City Club this week, declared that the Federal Reserve Board fully recognized the great importance of the automobile industry and would not discriminate against automobile paper of the proper character.

"We are always ready to accept automobile paper from our member banks," the governor said, "when it meets the requirements of our regulations and seasonal conditions in our district."

Governor Wellborn's address was regarded by automobile dealers in this section of the country as one of the most important addresses delivered before any automotive body this year, and as a result the attendance of this meeting was so large that the lecture hall at the club was packed to the doors and many of the dealers were compelled to stand in the aisles or in the hallway just outside. Between 350 and 400 state dealers and bankers, as well as many other business men, attended the convention.

William L. Mathers, president of the state association, and John E. Smith, president of the Atlanta association, were in charge of the meeting.

Mayor James L. Key of Atlanta delivered the address of welcome. "Atlanta fully appreciates the great importance of the automobile industry," the mayor declared, "even though the Federal Reserve Board may not. We recognize it as the biggest industry we have. It does more to uphold the value of real estate, to keep bank deposits high and for our general industrial and commercial welfare than any other business."

Governor Wellborn, in his address, said in part:

Inflation Due to the War

"The history of all great wars shows us that they are invariably followed by inflation and extravagance. The present depression is not going to last long.

"Between Jan. 1 and Oct. 1 of this year 70 per cent of the banks that are members of the Federal Reserve Board have increased their loans by an amount exceeding $1,800,000,000. This has been made possible by the accommodations extended member banks by Federal Reserve Banks. In the Atlanta district alone since Jan. 1, 1920, our loans have increased about $69,000,000. Does this look like the Federal Reserve Bank was shutting off credit?

"In the past few months the Federal Reserve Bank has financed farmers through member banks, and I wish to assure you now that we will allow farmers ample credits to meet their requirements for the gradual and orderly marketing of their crops.

Spring Curtailment Necessary

"Last spring we felt the necessity of inaugurating a campaign to control credit as the expansion of loans for luxuries was going up too fast. Then we found it necessary to call attention to the heavy burdens of automobile credits that were being thrown upon our banks. We had no intention of striking a blow at the great automobile industry, but merely wanted to discourage and, if possible, prohibit the reckless granting of credits to extravagant and impecunious purchasers of cars who could ill afford to pay for and maintain the upkeep of an automobile. I think our position and action should be appreciated by all substantial dealers who desire a sound and stable market."

Following his address, R. W. Heard, president of the Savannah Automobile Trade Association, asked Governor Wellborn the pointed question: "Will the Federal Reserve Bank rediscount automobile paper at the present time?"

To this question the governor replied that the bank would rediscount any automobile paper of the proper character, and providing it met with the requirements of the board.

A brief address regarding co-operation between the dealer and his banker was delivered by H. P. Heath, vice-president of the Macon National Bank. He reiterated Governor Wellborn's statement that the banks would be glad to accept automobile paper of the proper character.

An important address was made by F. E. Moskovics, vice-president of the Nordyke & Marmon Co. "The Dealers' Problems, Past, Present and Future, and the Relation of the Automobile Dealer and the Banker," was the subject of Moskovics' address.

FORD TO GET POWER RIGHTS

WASHINGTON, Oct. 22—Power for the proposed Ford tractor plant at Green Island, N. Y., has been promised by Secretary Payne, Department of the Interior, and Secretary Meredith, Department of Agriculture, who constituted the Federal Power Board in the absence of Secretary of War Baker.

Pledges have been made to former Mayor Cornelius F. Burns of Troy, Judge William E. Wollard of Albany, and James A. Beattie, president of the Troy Chamber of Commerce, that the required water power privilege will be granted Nov. 22.

Committee Changes Views on Car Tax

Association Officials Show Industry's Product Already Bearing Full Burden

NEW YORK, Oct. 25—After vigorous representations in behalf of the automotive industry the Tax Committee of the National Industrial Conference Board has decided to eliminate from its report recommending widespread changes in the tax laws, a proposal for a tax of 50 cents per horsepower on automobiles and one cent a gallon on gasoline. At hearings given by the committee, spokesmen for the industry contended that such taxes would be discriminatory. They pointed out that automobiles of all kinds already are bearing their full burden.

The committee had estimated that the horsepower tax would yield $100,000,000 and the gasoline impost $45,000,000. This would have been in addition to present taxes. Among those who appeared in opposition to the proposal were representatives of the National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers Association, the National Automobile Dealers Association, the Rubber Association of America and the American Automobile Association.

Alfred Reeves, general manager of the N. A. C. C., was the principal speaker against the plan. He showed by a chart that every user of a motor vehicle pays an excise tax when he buys it, a State license fee, a driver's license fee and a personal tax.

"We know what trucks mean to the country," Reeves said, "and it is unfortunate that people speak of the automobile as a luxury. More than 2,250,000 farmers and 101,000 doctors use automobiles. One-third of all the automobiles in use are owned in towns of less than 1000 population. If there is any question about the automobile being a luxury I suggest that use of them be forbidden for four days. I object to four taxes on automobiles when there are only two on face powder."

Among Reeves' supporters from the N. A. C. C. were C. C. Hanch, H. H. Rice and J. S. Marvin. M. L. Heminway and Sidney S. Meyers appeared for the N. A. M. A. and A. L. Viles for the Rubber Association. The committee was so much impressed with the arguments presented that it will drop the horsepower and gasoline tax plan.

OWEN BUILDS ONE A WEEK

WILKES-BARRE, PA., Oct. 26—Owen Magnetic Motor Car Corp., which is now in receivership, is turning out one car a week at the Fortyfort plant here.

Parts Shortage Cuts Production at Ford

Factory on Five-Day Schedule—Price Concessions Refused, Orders Increase

DETROIT, Oct. 23—Production in the Ford plant has shown a decided decrease during the last two weeks, the daily record running around 3500 as against 4100 during September. The plant closed last night until Monday and it is proposed to maintain the five-day week plan indefinitely.

In fact many reports are heard to the effect that another day may be lopped off the week though officials declined to deny or confirm the rumor. It is known, however, that at least two of the parts manufacturers who were approached by Ford officials with the "suggestion" that the company would pay a certain price for the particular parts, refused positively to consider it and as a result of that refusal the company finds itself hard put to find substitutes in sufficient quantity to permit scheduled production.

The company still is far behind with orders and as a direct result of the price cut sales have increased 25 per cent in all but three states, according to C. A. Brownell, advertising manager. The demand is sufficient to keep the plant operating at capacity and the question of securing parts is the handicap.

According to Brownell immediately following the price cut there was an increase ranging from 75 to 200 per cent from various sections of the country, gradually subsiding until it has now reached the general average of 25. North Carolina, Oklahoma and Georgia alone have failed to show large sales increases and that, Ford officials say, is due to adverse conditions with cotton crops.

At the end of the fiscal year the Ford Motor Co. announced a schedule of 1,250,000 cars for 1921 and immediately speeded up production until it went over the 4000 mark, set as a daily record, and reached a maximum one day in early September when more than 4200 cars were built.

Parts Makers Cut Wages to Meet Ford Terms

DECATUR, ILL., Oct. 25—The Malleable Iron Co. and the Wagner Castings Co., both of this city, have been assured of large orders from the Ford company if willing to accept a reduction in the price for parts. They have placed in effect a new scale of wages for employees which is a slight reduction from the old scale, and which will enable them to accept contracts for future construction from the Ford company. Unless this reduction is accepted it will not be possible to continue operation with the same sized force.

"All will have to do it sooner or later," asserted C. L. Liebau of the Decatur Malleable Company. "Companies are forced to sacrifice their profits in order to make the reduction and the employees have been asked to help. The Decatur Malleable has put the question of a reduction in wages up to its employees. The Ford company simply demands that the supply companies like our own make a cut in their prices, and, as it is a large buyer, the cut must be made."

Cotta to Operate on Creditors' Plan

ROCKFORD, ILL., Oct. 23—Representatives of the five largest creditors of the Cotta Transmission Co. have been appointed a committee to work out a plan for its future operations and for the meeting of claims against it. This company has been instructed to make a report not later than Dec. 20 and in the meantime it has been agreed that none of the creditors will take individual action. The members of the committee represent the John Obenberger Forge Co., the La Salle Steel Co., the Spring City Foundry Co., the New Departure Mfg. Co. and the Aluminum Foundry Co. The plan under contemplation proposes payments in cash of all claims of $300 and less.

Climax Rubber Buys K. & W. Company Plant

COLUMBUS, Oct. 25—The Climax Rubber Co. of Columbus has closed a deal whereby it has taken over the plant of the K. & W. Rubber Co. at Delaware, Ohio, which has been in operation for about a year. The plant, which has been giving employment to about sixty-five workers, is 200 x 50 feet, three stories high, and a wing 50x75 feet is being constructed. It is the plan of the Climax company to move the machinery now in use at Huntington, W. Va., to the Delaware plant and increase the output to about 2500 tubes daily. Later on it is planned to abandon Huntington.

The product of the K. & W. Rubber Co. has been the Maxotire, an inner liner, which will be continued, as it has a good sale. In addition, the Delaware plant will be used to manufacture plain and compression tubes, which are the products of the Columbus plant. Irving S. Hoffman is president; H. A. Longshore, vice-president; Merch E. Watson, secretary and treasurer, and Clyde B. Turner, assistant secretary and treasurer.

WILLYS WAREHOUSE RENTED

BOSTON, Oct. 23—The Government has leased the five-story cement warehouse, built but never used, by the Willys-Overland Co. in the Fenway district to be used now as parcel post headquarters for the Boston district. It is understood that high department heads have approved the recommendation to take over this building at an annual rental of about $120,000.

OLIVER STARTS RIM UNIT

ATLANTA, Oct. 22—Quantity production began this week in the new galvanizing plant of the Oliver Rim Co., with capacity at 500 rims per day.

British Car Imports Drop in September

Large Gains Shown, However, in Comparison with Year Previous and Gross Trade

LONDON, Oct. 13 (*Special Correspondence*)—There was a drop—probably due as much to the natural tailing off of the car sales season after August as to the sudden set-back to trade at large—in the number and value of *the imported cars and chassis* during September. This drop amounted to 1565 cars and chassis, but on the other hand there was a rise by over $35,000 in imported parts in September.

The number of imported cars was 2068 and of chassis 1231, and the combined value was nearly $6,000,000. In September, 1919, the number of cars imported was 363 and of chassis 460, the result showing a comparative increase for the respective months of September, 1919 and 1920, of nearly 6 to 1 for cars and 3 to 1 for chassis.

For the nine months of this *year* 27,966 *cars and* 10,549 *chassis were imported, as compared with* 1488 *and* 875 *respectively for the corresponding period of* 1919. During the same nine months the respective value of imported parts was, 1919, nearly $12,000,000; 1920, $31,750,000. For the same (nine months) period the value of imported tires was, 1919, nearly $7,000,000 and for 1920 nearly $21,333,000.

Britain exported in September 576 cars and 453 chassis, as against 114 and 102 respectively in the corresponding month of 1919, their respective values being, 1920, nearly $4,000,000, as against $710,000 in 1919. For the nine months of the two years the figures were, 1919, cars, 928, and chassis, 386, of the respective value of $3,310,000 and $1,350,000. The export of British parts in September, 1920, was valued at $884,000 and in September, 1919, nearly $406,000. For the nine months the value was, 1920, $7,134,620, and 1919, $3,741,235.

Despite the fears voiced in the Legislature concerning imported tires, and their ill effect on the British tire trade—one critic averring that it was the cause of the discharge of several hundred men from the largest British tire works, the returns show an excess value of tire exports over imports for the month of nearly $338,000 and for the nine months of over $4,225,000.

WORCESTER OFFICIALS RESIGN

WORCESTER, Oct. 23—Charles E. Hildreth, president and general manager of the Whitcomb-Blaisdell Machine Tool Co. and president of the Worcester Chamber of Commerce, and Albert E. Newton, vice-president and general manager of the Reed Prentice Co., state that they will resign their positions by Jan. 1. Both men are to devote their time to interests outside of Worcester, the nature of which they will not divulge.

Mexican Oil Fields Scarcely Touched

Official Says Producing Wells Capable of Doubling World's Supply for Past Year

SAN ANTONIO, TEXAS, Oct. 23—Few people of the United States realize the extent of the proved potentialities of the oil fields of Mexico, according to Engineer Manuel L. Stampa, who is a member of the party of Mexican Government officials, headed by General Jacinto B. Trevino, Minister of Commerce, Industry and Labor, which visited San Antonio a few days ago. Stampa asserted that the producing wells of the Gulf Coast region of Mexico, had they been permitted to flow to their full capacity, would have given a total output of more than 881,000,000 bbl. during the last twelve months, which is nearly double the entire world's production of crude petroleum for that period.

"The United States contains approximately 200,000 producing petroleum wells, with an average production of five barrels per day," he said. "In Mexico there is a total of only 334 producing wells. In 1919 Mexico exported 87,072,955 bbl. and for the same period the total oil production in the United States was 337,719,000 from a vastly larger number of wells; 57,590,993 bbl. were exported from Mexico from Jan. 1 to June 1, 1920.

"To understand the greatness of Mexico as an oil producing country and its possibilities, it is necessary to know that the actual productive zone is very small. To develop the industry it is necessary to increase transportation facilities. The pipe lines of Mexico have a length of a little more than 1300 miles. The actual oil production of the Mexican wells is about two and one-half times the pipe line capacity, but it is not necessary to increase the capacity of the pipe lines, but the capacity and number of tank steamers operating from Mexican ports on the Gulf Coast.

"The petroleum resources of Mexico are enormous and data obtained by a recent survey of the petroleum-bearing land in that country show that they aggregate one-third of all the country. The estimated oil lands are placed at 157,950,000 acres. Of this vast acreage only 54,720 acres are in actual exploitation.

"In Mexico there are 334 actually producing wells," Stampa continued. "Located wells which have not been drilled number 147. One hundred and twenty-three wells are being drilled and a total of thirty-five producing holes are now being used."

IMMEL EARNINGS INCREASE

COLUMBUS, Oct. 25—Receiver R. H. Schryver, of the Immel Co., manufacturers of closed automobile bodies, as well as doing a general automobile repair and painting business, reports that the output of the plant has been practically doubled since he took charge. He has eliminated a greater part of the heavy overhead and thus is showing a larger profit on the business. Among the steps contemplated toward retrenchment is giving up the plant on East Livingston Avenue, where repairing and painting is done, and selling it as a going concern. This will probably be authorized by the court. The Livingston Avenue plant was established in 1865 as a wagon and vehicle manufacturing concern and later changed to the automobile repair and painting business.

Radical Move Feared in British Car Plants

LONDON, Oct. 8 (*Special Correspondence*)—To add to the misfortunes of the automobile industry there is now a strike of body builders for 4 cents an hour increase and though some firms have conceded the demand, there is still a majority of the men out.

Meanwhile there is a movement toward a Soviet seizure of factories, at present confined to Coventry, which is the Detroit of the British automobile trade, where there are reported to be some 4000 to 5000 mechanics, but not all of them motor mechanics, out of work. This precludes the sort of "forward" movement that has lately been seen at Turin and other Italian manufacturing centers.

No violence has occurred up to date but with the cost of bread certain to rise in a few days and the issue of one or two extra favorable automobile balance sheets, the situation is undoubtedly dangerous.

The daily press is trying to blanket the affair, but the fact is that the neighboring center of Birmingham—the industrial capital of the Midlands—is likely to see a similar effort.

MULLINS PRODUCTION DROPS

YOUNGSTOWN, OHIO, Oct. 23—The Mullins Body Corp., Salem, are continuing operations on a heavily reduced schedule and are working only 50 per cent of capacity established in the last two years. Production of bodies for Lincoln, LaFayette and Cadillac cars is going forward on schedule and up to the original specifications. Reduction in the output has been placed against body orders for other cars.

H. C. Nelson, general superintendent, asserts that at this time there is not the slightest indication that the Mullins company will reduce its prices in the face of steadily stiffening steel prices. Sheets for the Mullin company are not expected to be obtainable at lower prices for many months.

LEECE REDUCES WAGES

CLEVELAND, Oct. 26—Two hundred employees of the Leece-Neville Co., manufacturers of starting-lighting systems for motor vehicles and motor boats, are now working under a general reduction in wages put into effect Oct. 21. Factory workers wages were cut 20 per cent, according to George F. Cole, general manager.

Confirmation Given of Arctic Oil Strike

Imperial Oil, Ltd., of Canada Gets Report of Well Producing 1000 Barrels Daily

TORONTO, Oct. 25—Confirmation came to the office of the Imperial Oil Ltd., of the report of an important oil strike in the company's well at Fort Norman on the Mackenzie River, near the Arctic Circle. The message came from the company's geological party which has just returned to Edmonton. No details as to the flow have been received, and it is thought that the engineers have not been able to measure it as yet. However, there is no doubt of the importance of the find, and the effect it will have on exploring for oil in the Canadian West. Earlier messages had been received from other sources in the far North stating that oil was flowing from the Fort Norman well at the rate of 1000 to 1500 bbl. per day.

In the absence of a detailed report to Imperial Oil, the following message received by Richardson, Sheppard and Thorburn from Capt. J. Willis Croft at Fort McMurray will be of interest, because, although at the time it was not confirmed the bare message received by Imperial would give an appearance of it:

"Your wire to Northern Trading Co. referred to me. Imperial Oil well at Fort Norman, blown Aug. 25, approximately 850 feet now exceeds 1500 bbl. per day. Analysis of oil can be obtained from the Deputy Minister of Mines, Ottawa. Believed big oil beds not touched yet."

The Imperial Oil has been diligently exploring in Western Canada for the past two years, and during the present season eleven rigs had been at work. At the location on the Mackenzie River, below Fort Norman, the river is some three miles wide. Imperial has staked out nine miles of river bank on one side and eight miles on the other, with the islands in between. At the time of the first strike of oil in this well in August last, President C. O. Stillman said that the product was as good commercial as has ever been produced in Canada, and runs about 40 Baume gravity.

Seventy Cars Bring $65,000 at Auction

BOSTON, Oct. 22—Seventy automobiles, property of the Massachusetts Motors Co., Inc., of Boston, bankrupt, brought $65,200 at an auction conducted at the Federal Building yesterday by the trustees of the bankrupt firm. Charles F. Rowley, one of the trustees, acted as auctioneer. There were three bidders.

The automobiles were sold to David Stoneman, attorney, representing an unknown purchaser. Ten per cent cash was paid in the courtroom, and the balance will be made up in payments as agreed upon by the trustees.

New Signs of Life Spur Sales Efforts

Renewed Interest Shown in Cars Though Active Buying Is Held Back

(*Continued from page* 886)

by low-priced cars in these States but the higher priced vehicles have been practically dead in this territory for the last three months. This gratifying situation is attributed in part to the harvest but chiefly to an active selling campaign.

St. Louis reports an increasing interest in automobiles which has not yet been translated into sales. The same is true in Atlanta. Price reductions have stimulated business in the Dallas district and dealers believe the increase can be maintained. Business in Louisville is about at a standstill.

Sales in Indianapolis have shown marked improvement in the past week but in Cleveland there is less demand than in months for cars which have not been reduced in price. Business in Boston is picking up slowly but in Buffalo prospects apparently are waiting for further price recessions.

New York dealers have found an upward trend in sales and a greater interest in cars. The public in Chicago is still hesitating because it does not believe the bottom has been reached in price reductions.

In this survey made by AUTOMOTIVE INDUSTRIES no request was made for specific information on the effect of price reductions. It was believed this would be reflected automatically in the reports. The results of lower prices to the public apparently have been spotty but on the whole they have stimulated business. In New York and some other cities there was a rush to the sales rooms for a week or two after cuts were announced but after this demand had been satisfied sales dropped back, although they did not reach previous low levels. In a few cities cars which were not reduced have suffered in consequence but this condition is not general.

Lower Prices Started Trade

It is significant, however, that business began to improve as soon as the wave of price reductions began. These price cuts had a far reaching psychological effect not only on the public but on dealers as well. They served to clear the atmosphere. It is possible price guarantees did just as much in the same direction.

They proved that the market for cars was not dead and that they could be sold if sufficient effort was made. Dealers in lines which had been reduced saw an opportunity to make money after many lean weeks and they inspired their sales forces with some of their own enthusiasm.

Dealers whose manufacturers did not reduce saw what business they had slipping away from them unless they knocked a hole through the sales resistance with which they had been confronted. Spurred on by their own need and the insistance of the car makers they called their salesmen together and told them grimly to go to work with no very veiled intimations that the man who did not deliver the goods would find himself hunting for another job. The result was apparent almost instantly. It is responsible for the better tone which prevails in almost all parts of the country.

Grandchildren of the present generation of dealers probably will still be trying to determine whether genuine, well directed sales effort could not have produced the same result at price cuts. Certainly it is a mooted question to-day.

The fact remains, however, that out on the firing lines business is better and that the upward trend does not seem to be merely sporadic.

Anderson Makes Plans To Meet Conditions

ROCK HILL, S. C., Oct. 22—Seventy-five Anderson dealers and distributers representing nearly every state in the Union attended a three days' sales convention here this week. The meetings were devoted to the price question, service problems and winter merchandising. The new 1921 Models which will be brought out after the first of the year were also discussed and the new body designs gone over both from the point of appearance and construction.

The convention was planned and carried out by J. G. Anderson, president of the company, and W. A. Anderson, general manager. At the conclusion of the convention it was announced the price of Anderson cars would be put back on the old price level of $2,145 for the closed models.

E. C. Roberts, vice-president of the National City Bank of New York, gave an interesting talk on the general financial condition of the country and predicted that this country was in condition to successfully weather any possible financial crisis. Harry Tipper, of AUTOMOTIVE INDUSTRIES, addressed the convention on the basic factors underlying the automobile industry and explained how the modern mode of transportation had so completely changed the conditions under which we live that the widespread use of automobiles has become an economic necessity.

NEW ORLEANS GETS NEW PLANTS

NEW ORLEANS, Oct. 23—The Prestolite Co., a subsidiary of the $70,000,000 Union Carbide & Carbon Co., New York, has commenced the erection of an acetylene gas manufacturing plant on a seven-acre tract purchased Oct. 5 and located just outside the limits of the city of New Orleans, in Jefferson Parish. The land was bought for $15,000, and the investment, as reported by the New Orleans Association of Commerce, will reach about $200,000.

The Linde Air Products Co., also a subsidiary of the Union Carbide & Carbon Co., has commenced work on an oxygen-producing plant.

Eight Billion Sale Possible on Farms

Enormous Potential Market for Automotive Products, Says Expert, if Earnings Warrant

WASHINGTON, Oct. 22—American farmers will offer manufacturers and dealers of automotive equipment an $8,000,000,000 market within the next decade should agriculture be put on a normal profit basis of 6 per cent of its annual production, according to a conservative estimate given to-day by Frank G. Odell, director of research, the Capper Farm Press in an address here at the annual dinner of the Joint Stock Land Banks. These figures were used to illustrate the buying power of the farmer and his place in the business world.

A grand total of $20,000,000,000 was given but this figure included $10,000,000,000 for new buildings or repairs on 2,000,000 farms at an average cost of $5,000 and $2,000,000,000 additional for silos and dairy equipment.

What the dealer may anticipate when farmers are financed so that farming shows a profit comparable with other lines of business follows:

Automobiles, 2,000,000 cars including replacements at an average of $1,000 would have a sales value of $2,000,000,000; one million tractors at an average cost of $1,000, a total of $1,000,000,000. The same amount of trucks with an average cost of $2,000 would make a sales total of $2,000,000,000. Automotive farm equipment and all agricultural machinery necessary in the next ten years based on increase during last two census periods would require an expenditure of another billion while electric light and power plants, many operated by gasoline engines, would add $2,000,000,000 to the total. It is estimated that a 6 per cent net return on annual agricultural production would pay the bill within fourteen years.

These estimates were furnshed at a meeting of supporters of the Farm Loan Act which has been attacked by various interests. It was pointed out that farmers have mortgages aggregating $4,000,000,000, a debt which they propose to extinguish over a long term of years. A fight is being waged to save the Farm Loan Act so that by this means financial assistance may be obtained.

SOUTHERN PLANS PRODUCTION

MEMPHIS, TENN., Oct. 25—The Southern Automobile Mfg. Co. has a handsome model car on the streets of Memphis. A truck to be known as Southern Sixty, a tractor known as Southern and two models of the Southern Six will soon be on the market, one a sport and the other a three-passenger roadster. The company expects to build 2000 machines in the next eighteen months, after which it is hoped to reach a capacity of 20 cars a day. Automobiles will be manufactured first, then trucks, tractors and tires. The car is designed to sell at $2,995.

Special Cables

Strike May Delay Olympic Car Show

Possibility of Abandonment Arises—Citroen Cuts Prices—Repeal French Fuel Duty

(By Cable to AUTOMOTIVE INDUSTRIES)

PARIS, Oct. 25—The miners' strike in England and the threat of the transport workers to join them has raised the possibility of the abandonment of the London Automobile Show which has been set for Nov. 4-13. Arrangements for the exposition are being continued, however, and Continental exhibits are being shipped, but unless the strike situation improves next week it is quite likely the show will have to be postponed. In this event Continental manufacturers would be particularly inconvenienced because a postponement would make it impossible for them to get their cars back in time for the Brussels show which opens Dec. 10.

The English Austin Co. has dismissed 1200 employees.

Citroen has put into effect the price reductions promised if sufficient orders were received to justify them. His four seated car will sell for 15,900 francs, the sedan for 19,000 francs and the coupe for 22,500 francs. These prices include the luxury tax.

To meet the present crisis Delage has produced a four cylinder car along the same lines as the high-grade six cylinder. The complete chassis is listed at 39,300 francs.

As a result of protests of the French automobile industry, the government has decided to repeal the recently imposed duty of 20 centimes a litre on gasoline. The price of gasoline having increased from 45 centimes to 3 francs a litre since 1914, an important fuel economy competition has been announced for the spring of 1921 to cover all of France. Cash prizes equivalent to $5,000 has been offered.

Emanuel Brousse, liquidator of the army automobile stocks, announces that it now is the government's policy to sell complete parks of automobiles to retailers. The American parks at Ourg and Romorantin already have been sold and the others will be disposed of within a few days. The experiment of direct sales to the public by the government has not proved a success.

The French Syndicate of Airplane Manufacturers of which Alfred Le Blanc is president, expects to complete arrangements this week for the purchase of all the surplus French army aviation material. The purchase price will be 60 per cent of its estimated value.

The Peugeot company which contemplated erecting an American factory has broken off negotiations and decided not to begin the manufacture of cars in the United States for the present at least.

BRADLEY.

Harper-Bean Group Reduces Car Prices

LONDON, Oct. 15—(*Special Correspondence.*)—The Harper-Bean group, whose output is handled by the British Motor Trading Corp., recently cut the price of its Swift car by £55 ($275 prewar rate) and followed a few days later with a cut of £100 ($500) in the Bean car. Both these cars are in the light car class.

Ford's decision, presuming it is based on the cabled explanation that he intends to do something to end profiteering in materials and generally to bring about the "status quo ante bellum," is likely to be a potent check on the revolutionary spirit which threatens dire mischief here as elsewhere in Europe.

Since the war, and chiefly arising out of the necessities of the wartime when the government virtually controlled output and allotted materials to manufacturers acting in groups according to the class of output each was engaged on there has been an increasing series of rings and combines in Great Britain which maintain prices and make it impossible to get independent quotations.

The motor industry in Britain is still considerably perturbed by the flood of imports from foreign countries, chiefly America. During August imports of touring cars and commercial vehicles totalled 3438 against 504 in August, 1913. An official statement issued by the United States Government shows that during the first eleven months of the present fiscal year Great Britain took over $5,500,000 worth of commercial motors as against $2,500,000 in the preceding year. The same report states that the total number of commercial motors exported was 21,000 as compared with 11,000 in 1919, while passenger cars reached 103,000 as against 33,000 in 1919. On the other hand exports of British touring cars and commercial vehicles show a decline, the figures for August, 1913, being 610, but only 514 in August, 1920.

STANDARD HORN ASSIGNS

EVERETT, MASS., Oct. 25—The Standard Automobile Horn Co. has made an assignment for the benefit of creditors. This action was made necessary because it could not turn its assets into cash. The liabilities are $9,029 and the assets $7,915.

Markets Still Open in South America

European Makers Seek Recovery of Trade — Improvements Needed in Methods Here

BUENOS AIRES, Sept. 20—(*Special Correspondence*) — Customs duties in general in the Argentine have been increased 20 per cent and Uruguay has passed a new law placing a very low duty on the chassis of motor cars but an exceedingly high one on the body in order to give the advantage to a national industry as the bodies made in these countries are very good. When cars arrive either in Argentine or Uruguay they are subject to two duties, one on the body and the other on the chassis.

Considerable difficulty is being experienced with American trade at present because the exchange rate is extremely high and customers do not wish to accept drafts as the orders were taken when the exchange rate was normal at 103. At present it is at 118. Most of the large firms have given their customers extensions in the hope of avoiding the high rate, for if the drafts were paid at the present time the loss would be heavy.

Speaking generally, American manufacturers are giving better service to their customers in South America, but there still is room for improvement as they have not yet mastered the export business. European manufacturers are doing their best to recover the trade they lost during the war and representatives of both English and French companies are constantly coming to South America. Several of them have had different cars imported. This list includes Renault, Hispano-Suizo, Panhard, Vauxhall, Wolsley, Argill and Daimler. Several other factories have studied the market and are introducing new cars.

The trade seems inclined to give preference to high priced European cars rather than to those of similar price manufactured in the United States.

One practice of the American manufacturers which has injured their standing with South American automobile men is that of opening factory branches after some dealer establishes their line through the hardest kind of work.

The tire business in the Argentine and Uruguay is excellent. One dealer alone is planning to spend $700,000 in the purchase of tires, although he will lose about 15 per cent on drafts.

GIERHOLT MOTORS TO BUILD

DETROIT, Oct. 23—Gierholt Motor Co., manufacturers of Outboard motors, is negotiating with authorities at Marine City, Mich., for the erection of a motor plant there. Negotiations are said to be progressing favorably and the construction of the plant is believed to be assured. About 200 men will be employed. The company manufactures motor-boat and marine engines.

Germans Attempt U. S. "Penetration"

Zeppelin and Junker Interests Lead—Inside Facts of Their Campaigns

NEW YORK, Oct. 18 American aeronautic interests are seeking diligently to determine whether or not there is a foundation of fact back of a cable dispatch from Paris asserting that the German Zeppelin works would be transferred to the United States because of the restrictions placed by the Peace Treaty upon the manufacture of aircraft within Germany.

There is frank skepticism over the probability of any such move in the near future at least. It is believed to be merely another step in the plan for "German penetration" of the United States in aeronautics. It follows the visit to this country in June and July of the managing directors of the Zeppelin Co. and their futile efforts at that time to interest American manufacturers in the project of establishing a factory here for the construction of dirigibles to be used in trans-Atlantic flights.

The Germans visited the plants at Akron of the B. F. Goodrich Co. and the Goodyear Tire & Rubber Co. and then called on Henry Ford at Detroit. It is understood that neither Goodrich nor Goodyear are interested at this time in the further development of aeronautics. They are having plenty of trouble in the tire field. Neither has it developed that Ford has entered into an agreement with the Germans.

There have been later reports that the Hamburg-American Steamship Co. would back the Zeppelins in the establishment of an airship service between Berlin and San Francisco. This report had it that American money would provide landing fields near New York and on the Pacific Coast. The inference was that if any American interests were connected with the enterprise they were those in the American Ship & Commerce Corp. which has entered into a trade alliance with the Hamburg-American line.

Errand Here Mysterious

Little has been told in this country of the more or less mysterious visit of the Zeppelin representatives. There were three of them and they came in June. The members of the party were: Alfred Colsman, president of the Zeppelin Airship Construction Co., Ltd., of Friedrichshaven; W. E. Doerr, vice-president, and Herr Milatz, another vice-president. There have been intimations that their entry into the country was facilitated by officers connected with the aviation service of the Navy.

The Germans were introduced to certain American aircraft manufacturers by Lieut. Raafe Emerson of the Lighter-than-air Division of the Naval Air Service. It is known that the Germans attempted to sell the United States Navy on balloons. While here the Zeppelin representatives had frequent conferences with officers of the Navy who scanned with deep interest their detailed plans for construction of huge airships. But nothing ever has been disclosed concerning these deliberations and the facts regarding them are locked up in the archives of the Navy.

The point about which American manufacturers are in doubt, is whether Herr Colsman and his associates actually succeeded in obtaining American backing for their enterprise. About the time that they were here Ford sent to Europe his chief aeronautic adviser to study aviation abroad, but there has been no report on the results of his investigation. The anxiety of the Zeppelins to transfer their operations to this country is easily explained. The Allies have taken a firm stand for the rigid enforcement of the military provisions of the Peace Treaty and thereby have put a crimp in the development of aeronautics in that country.

Must Meet Armistice Terms

The armistice provided that the Germans could not resume the construction of aircraft until six months after the signing of the treaty and then only after the delivery to the Allies of vast quantities of war supplies. These supplies had not been delivered late in June although the six months expired on July 10 and the Allies gave notice that no new construction would be permitted until the treaty terms had been executed to the last detail.

The Zeppelins are not confining their activity to the United States, however, for it is known that they are selling dirigibles to Japan and that negotiations are under way for the establishment of factories in that country.

The visit of the Zeppelin officials was only one of the steps taken to facilitate interest here in German aircraft.

Even more interesting from a practical viewpoint has been the effort of the Junker interests to convince this country that all-metal planes are the last word and the crowning point of aviation. A Junker appeared at the aviation fields on Long Island in June and was hailed as a sensation but crashed on its first or second flight. This machine was in charge of Emil Mons, a German army pilot.

Then along came John Larsen, with the J L 6, which is in reality a Junker plane, although a skilful attempt was made to give the impression that it was a triumph of American genius. The planes of this type were brought in by Larsen, who paid duty on them at rates ranging from $2,000 to $4,000. This value must have been arrived at on the basis of the exchange value of the German mark in American dollars, for the planes were sold over the counter by Larsen for $30,000 each. Three of the J L 6 machines were bought by the Navy for $30,000 each, three by the Army and eight by the Post Office Department.

These planes were taken over by the governmental departments without any

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Motor Trucks Vital Says State Official

Massachusetts Commissioner Declares Field for Operation Must Be Increased

BOSTON, Oct. 22—Highway conferences featured the annual meeting of the Massachusetts State Chamber of Commerce at the Hotel Vendome here. Speakers included experts on the subjects of highways. John N. Cole, commissioner of public works of massachusetts, spoke of the intimate connection between good roads and proper housing facilities.

Cole said in Massachusetts the people are more dependent on the highways than in any other State because of the lack of co-ordination and co-operation of the railroads and the inadequate and unsystematic terminal facilities of Boston. "The Boston terminal problem," he declared, "is more serious than most people realize and is intimately related to the whole question of highways as they affect the short haul for freight and motor transportation. "The State must increase the field for motor transportation," he said, and he illustrated by various striking incidents and personal experiences the important, even actually vital part, the motor truck now plays in the industrial progress of the State.

"The cost of this increase in the highways of the State," the speaker emphasized, "must be shared by everybody. The man who rides on the public highways and the one who transports his goods over them must be taught that he has got to pay for the roads over which he rides and carries his products.

Commissioner Cole said that to-day the public roads are a new civilizer, knitting together as they do the State of Massachusetts and the States of New England. A striking remark of the speaker that surprised his hearers and indicated one of the sources of expense for highways was that in Massachusetts less than 10 per cent of the bridges on the highways are adequate to the loads that are daily passing over them, and $30,000,000 will have to be spent on their reconstruction in the near future.

E. F. Broadwell, vice-president of the Fisk Rubber Co. of Springfield, and George L. Ellsworth, general counsel for the Automobile Legal Association, were other speakers.

FEDERAL RECEIVER ASKED

BOSTON, Oct. 22—A petition has been filed with the United States District Court asking for the appointment of a receiver for the Federal Corp. of Westfield, manufacturers of automobile and motor supplies. It is alleged that the Federal corporation is threatened with suits by creditors and for that reason has been unable to raise money to buy material with which to finish up its many contracts. The petition shows that the company has $170,467 in assets, an excess over liabilities.

King Sale Likely Before Week's End

Prominent Detroit Men Said Negotiating for Immediate Assumption of Company

DETROIT, Oct. 26—Sale of the King Motor Car Co. to a group of prominent Detroit men is said to be highly probable before the end of the week. H. R. Crusoe, representative of the Detroit Trust Co., which was named as receiver upon petition of five directors who seek dissolution of the company, declined to give the names of the prospective purchasers, but said one of the largest creditors would head the syndicate.

Frank J. Smith, vice-president of the First & Old Detroit Bank, also declined to give names, but said the men who had submitted the proposition for taking over the property were well able financially to put it on its feet and make it one of the big companies.

Crusoe's statement as to the creditor interested is difficult to understand in view of the fact that none of the creditors aside from Artemas Ward, Sr., has a claim much in excess of $10,000. Barney Everitt is said to have been eliminated as a probable purchaser in view of his announced determination to take an active part in the management of the Gray Motors Corp., which is soon to put a new car on the market.

Crusoe has named R. G. Hendricks, production manager of the plant, as his aid in the operation of the factory during receivership.

Hendricks said the factory would be continued at least until thirty cars had been completed, even though the negotiations for its sale fell through. The thirty cars were in process of construction when the receivership came and can be completed, he said, with very little additional expense. Hendricks also said he was at work on a plan to keep the plant running after the thirty cars were built, though he expressed confidence that one of the two propositions under consideration would result in a sale within a few days.

To Ask Executive as King Receiver

NEW YORK, Oct. 26—An effort will be made by the merchandise creditors of the King Moto Car Co. to have the Detroit Trust Co. removed as receiver and an experienced automobile executive appointed in its place. Economy would be the main purpose of this step and it also is believed better results might be obtained by having an experienced man devote all his time to the company's affairs. Sidney S. Meyers, general counsel of the Motor and Accessory Manufacturers Association is now receiving assignments of claims and will go to Detroit in a few days to investigate the situation.

There has been much speculation in the industry in the last week as to what was behind the decision of the controlling directors to seek dissolution of the company. So far as can be learned there is no mystery about it. Artemas Ward, Sr., father of Artemas Ward, Jr., president of the company, is anxious to withdraw and is tired of putting up money for what has been a losing venture from the start.

It is understood the investment of the Wards in the King car approximates $1,750,000. About $1,200,000 of this amount was put into the old company before its reorganization some seven or eight years ago and $548,000 has gone into the new company. This includes about $100,000 expended in subway and street car advertising.

The company is solvent, theoretically, at least and it is probable creditors will receive their claims in full. A large sum was spent in the erection of a large modern plant in Detroit and steps already are under way for the organization of a new corporation to take over the old.

Kelly Adds $2,000,000 to Capital Stock

SPRINGFIELD, OHIO, Oct. 27—The Secretary of State at Columbus to-day authorized the Kelly-Springfield Truck Co. to increase its capital stock from $6,000,000 to $8,000,000. This will take care of a proposed increase of the common stock from $2,000,000 to $4,000,000. The par value of the common is $100 a share.

President James L. Geddes announced that the stockholders have approved the increase in stock. Concerning a proposal to increase the number of directors Geddes said no action had been taken.

The proposed affiliation with the Hare Motors Corp. of New York city, especially regarding the combination of the selling forces, will be taken up later. Captain Marion McMillin of Emerson-McMillin & Co., of New York, and James Willard Young, financial man of the same company, will remain in the city for a few days.

It is expected that an announcement will be made by the Kelly-Springfield Co. soon that it is prepared for an extensive business campaign. Its facilities have been greatly increased as a result of the erection of a large factory addition.

STILL MAKING RIKER TRUCKS

NEW YORK, Oct. 26—The Locomobile Co. of America has not ceased the manufacture of Riker trucks, according to a statement made to-day by Hare's Motors. It was stated that the item to this effect printed in AUTOMOTIVE INDUSTRIES of Oct. 7 was an error, probably resulting from misunderstanding in Bridgeport of an announcement that a lot of Rikers of a certain size and specification were being completed and that no more Rikers of that particular size and specifications would be started at that time. Manufacture of the trucks has not been discontinued, however.

Goodyear Withholds Source of Finances

Company Said to Have $30,000,000 at Command—Interest Rate Under 9 Per Cent

AKRON, Oct. 28—Reports emanating from New York and Chicago that a syndicate of bankers in those cities have agreed to loan the Goodyear Tire & Rubber Co. $10,000,000 at 9 per cent for from two to four months were flatly denied here to-day. The report that Goodyear is working down its inventory so that $10,000,000 will meet its immediate needs also is an exaggeration.

Although no official statement has been made on the subject, it can be stated that the Goodyear company now has at its disposal all of $30,000,000 at a rate lower than 9 per cent and for a period longer than four months. The bulk of the money is not coming either from New York or Chicago but from sources surrounded with mystery and which officials refuse to reveal. The bankers' syndicate may be included in the transaction but not alone. The refinancing of the company will leave the management in the hands where it now rests.

The bank syndicate which has been mentioned included the Continental & Commercial Trust Co. of Chicago, the Chase National Bank of New York, Lehman Bros. and Goldman, Sachs & Co.

The only statement that has been forthcoming from official quarters was made to-day by Vice President George M. Stadleman, pertinent to the company's sales at the end of the fiscal year closing Oct. 31.

"In spite of the present depression in business throughout the country the Goodyear Tire & Rubber Co. will, on October 31, close the largest sales year in its history," reads Stadleman's official statement. "While it is impossible to state to-day just what our total sales will amount to, I am able to give assurance that they will be in excess of $205,000,000, which, compared to 1919 sales of $167,000,000 and $9,560,000 ten years ago, should offer significant testimony as to the possibilities of the future.

Company Favorably Situated

"Here on the threshold of a new fiscal year and in spite of existing conditions we find ourselves in the most favorable strategic situation from a sales standpoint that we have ever enjoyed. Notwithstanding all the difficulties which we are now having to confront, our present position in the trade makes my conviction absolute that the situation in our particular industry is wholly temporary. When the present period of depression is over and if our sales organization continues to employ vigorous sales efforts, I am sure we will have a larger share of the available tire business than ever before. When it is realized that if every car and truck owner in America would to-day buy just one tire there would be an actual shortage as to normal stocks, there is no occasion to worry."

Fuel Standardization Goes to Committee

Viscosity to Substitute Gravity in Lubricating Oil Tests—Economies Expected

WASHINGTON, Oct. 22—Recommendations of automotive engineers and oil refiners have been taken under advisement by the Committee on Standardization of Petroleum Specifications, which conferred with representatives of automobile manufacturers, oil companies and state oil inspectors Monday and Tuesday relative to revision of specifications for Government purchases. The committee went into executive session and its findings will probably be announced by Monday.

The committee indicated at the conference that it would eliminate "gravity" from the old lubricating oil specifications and adopt new standards for viscosity, based on the viscosity of Mexican oil of corresponding gravity. H. C. Mongey of Dayton, Ohio, representing the General Motors Research Corp. advocated the elimination of all Class B specifications which covered lubricants used in turbines, dynamos and high speed engines.

Dr. G. W. Gray, chairman, and a member of the technical sub-committee of the Bureau of Mines, told the conferees that it was the intention of the committee to re-write the present methods of testing gasoline. As to motor gasoline, T. S. Cooke, representing the Standard Oil Co. of Indiana, suggested that the present specifications adopted for general purposes, set too low a temperature limit at which the bulk of the fuel must distill over; T. G. Delbridge, chief chemist for the Atlantic Refining Co. and Roger Chew of the Standard Oil Co. of New Jersey, agreed that 90 per cent point of 374 deg. was not the best. Delbridge urged that the committee raise the 90 per cent temperature from 374 to 392 deg. Fahr. because the present temperature for this point is inconsistent with other points in the distillation process. He also proposed that the committee formulate specifications for gear chain and wire rope lubricants to be of different viscosity for different uses.

Wanted Transmission Tests

K. C. Mackensie, a New York oil expert, inquired why the committee had not made provision for cold tests of lubricants used in transmissions. The chairman explained that no such provision was necessary as other points in the specifications made it a cylinder stock proposition.

Inquiries brought out the fact that the committee would probably fix the carbon residue specifications on liberty aero motor oil and motorcycle oil at 1.5. Joseph L. Kulp, A. M. E., chief oil and lubrication, United States Air Service, a member of the committee, suggested that the refiners devote more attention to research into lubricants needed in aviation engines.

In a colloquy with the chairman, Mongey drew out the unofficial opinion of the committee that uniform specifications in all States would eventually increase the supply of gasoline through improved refining processes.

The committee will formulate new spefications for fuel oil to guide government purchases. It will also consider the revision of the present specifications for gasoline and other products.

The S. A. E. had several representatives at the conference, including Oliver P. Zimmerman, International Harvester Corp., representing A. P. Eves, chairman of Standards Committee, Lubricants Division; Winslow H. Herschel, Bureau of Standards, and G. B. Upton, Cornell Unversity, both members of the same division; Walter E. Jorning of the Packard Motor Car Co., and S. M. Jones of the Kelly-Springfield Co.

N. A. C. C. URGES TRAFFIC BUREAUS

NEW YORK, Oct. 26—The Motor Truck Committee of the National Automobile Chamber of Commerce has undertaken a campaign to have every Chamber of Commerce in the country organize a traffic committee in charge of a traffic expert. It believes these committees should be able to recommend to industry the kind and type of transportation to use. It contends that there is and probably always will be a shortage of freight cars and that the possibilities of the motor truck for less than carload lot use in short freight hauls should be emphasized. Under the plan proposed tariffs and other necessary data always would be on file in the Chambers of Commerce for the use of shippers.

Cincinnati Endorses Open Shop Movement

CINCINNATI, Oct. 25—The Division of Manufacturers of the Cincinnati Chamber of Commerce is taking a referendum of its members on the question of the open shop plan. Replies received show a sentiment for the plan. Many of the replies instead of confining themselves to aye or nay took the form of comment on the movement to establish industrial freedom in the city and pledged full support to any concerted movement that might be inaugurated.

Among the indorsements were a number from the printing trades, whose employees recently went on a vacation. The general sentiment of this trade is strong for industrial freedom. Since the machinists' strike many of the machine tool manufacturers have been operating on either the open or non-union principle. Motor car and truck manufacturers are now operating non-union shops.

Bank Merger Viewed As Aid to Industry

Consolidation of Cleveland Institutions Expected to Give New Financial Strength

CLEVELAND, Oct. 25—The automobile industry here—including retailers and manufacturers—received with pleasure an announcement that four of the largest banks in the city, with resources of approximately $300,000,000, are to merge.

The banks whose assets are to be combined are the First National, the First Trust and Savings Co., the Citizens Savings & Trust Co., and the Union Commerce National Bank. According to the latest statements of the institutions involved the resources amount to $293,644,753; capital, $11,750,000; surplus, $15,880,687; and deposits, $225,654,325.

Both retailers and manufacturers of automobiles, particularly the latter, have been handicapped because of the inability of local financial institutions, because of their limited capital, to handle some of the larger loans desired. Much of this business has been going to New York City, Philadelphia and Chicago.

The Akron tire manufacturers and makers of auto accessories in this territory have been, in some instances where particularly large financing plans were involved, passing this city and going to other places where there are financial institutions of sufficient strength to care for their wants.

In consideration of this situation, efforts to build up larger banking units here have been progressing for several years. Several of the smaller banks have been brought together through mergers or outright purchase of assets, as it has long been realized by Cleveland bankers that larger and more powerful financial institutions should be established here to enable the many industrial firms of Ohio to do their banking here.

The merger has been accepted in automobile circles as taking a step forward in the interest of greater business facilities and the setting up of means that will bring about expansions when needed.

CASTINGS CAPITAL INCREASED

DETROIT, Oct. 23—Employees of the Detroit Metal Castings Co. probably will awaken Christmas morning to find in their stockings a stock bonus, the gift of the company, which has increased its capitalization from $60,000 to $1,300,000. Just when the distribution to employees will be made is not known, but an official of the company to-day admitted a portion of the increase would be devoted to such distribution. Incidentally the company proposes to declare a stock dividend, but the amount could not be learned. None of the stock will be put on the market. The increase, it was said to-day, primarily was to put into the capital account the actual invested capital.

Agreement Sought on Standard Parts

Indications Said to Point to Favorable Action by Stockholders November 10

CLEVELAND, Oct. 26—Stockholders of the Standard Parts Co. will meet in this city, Nov. 10, to vote on the refinancing plan that was devised and made public recently by a special committee representing the creditors, and stockholders. The committee has been in charge of reorganization plans since the company went into the hands of a receiver Sept. 1.

Notices of a meeting of the stockholders to pass on the plans have been mailed, and with them were sent proxies and full details of the refinancing plan. Under it, stockholders, both common and preferred, are to subscribe to $4,500,000 of 8 per cent Class A preferred stock. A syndicate of investment houses is to underwrite $3,000,000 of 8 per cent debenture stock and then Cleveland banks interested in the deal are to issue $4,000,000 of credit at a low rate of interest.

The Cleveland banks will hold open their offer of credit until Dec. 1, according to Cyrus S. Eaton, chairman of the reorganization committee. If the subscriptions are made, which seems likely according to information reaching persons leading in the reorganization, the receivership will be lifted before Dec. 1.

"It is important that stockholders send in their full subscriptions as soon as possible after receiving notices and details of the reorganization," said Eaton. "Subscriptions will be received subject to the approval by the stockholders at their meeting on Nov. 10, of the refinancing plan."

At offices of the Standard Parts Co., it was announced that business has been excellent the past month, and the trial sheet shows a satisfactory balance.

TO PRODUCE WELDING GASES

KENOSHA, WIS., Oct. 25—The Wisconsin Oxy-Hydrogen Co. has been formed with $150,000 capital to build a plant for the production of oxygen and hydrogen gases for use in welding processes. The shop will be two stories, 50 x 150 feet, and a duplicate of the plant of the Indiana Oxygen Co. of Indianapolis. C. P. Brant is president and W. G. Schoonover, secretary and treasurer. W. L. Brant will serve as general manager.

CORRECTION

NEW YORK, Oct. 25—AUTOMOTIVE INDUSTRIES has received a telegram from the H. H. Franklin Mfg. Co. stating the percentage of increase in business since price cuts were made, as given in a message printed last week, should have been 140 per cent instead of 400 per cent as stated in the original wire.

NO WILLYS MERGER WITH GENERAL MOTORS

NEW YORK, Oct. 25—John N. Willys has issued a statement denying persistent reports that his interests are to be taken over by the General Motors Corp. In the statement he says:

"There are no negotiations under way for the acquisition or merger of Willys-Overland Co. with General Motors. Our retail sales have been increasing steadily since last month and we expect shortly to be on a normal basis for this season of the year."

Wyoming Tire Buys Perma-Loc Property

WILKES-BARRE, PA., Oct. 22—The Wyoming Tire & Rubber Co. has acquired the interests and properties of the Perma-Loc Mfg. Co. here. The price has not yet been disclosed and the plant will be taken over immediately. The plant has 35,000 feet of floor space and employs about 200 men.

The executive officers of the Wyoming Tire & Rubber Co. will remain the same and it is understood that part of the old Perma-Loc management will be retained. New managers will be announced in a few days, it is said. A. F. Engelhardt, president, and M. A. Fischer, treasurer, of the rubber concern, were instrumental in consummating the deal. The officers of the Perma-Loc Co. are F. C. Kushel, president; George Weaver, vice-president, and G. B. Myers, Scranton, treasurer.

The Georgetown plant of the Wyoming Tire & Rubber Co. has been rebuilt and is about ready for the installation of machinery.

ALLEN FUND NEARLY COMPLETE

NEW YORK, Oct. 26—Nearly 95 per cent of the $500,000 which will be used to put the Allen Motor Co. of Columbus on its feet and lift the receivership has been subscribed by the stockholders and bank creditors. The outlook for the future is more hopeful than it has been at any time and there is every reason to believe the receivership will be raised in the near future. The company is doing a good business and the plant is being operated in an efficient and economical manner.

PUGH WHEEL PATENT UPHELD

MADISON, WIS., Oct. 22—The United States District Court for the Western District of Wisconsin, in a suit brought by the Wire Wheel Corp. of America against the Madison Motor Car Co. of this city, has upheld the validity of the Pugh patent No. 1047702. The patent covers the triple spoke lacing used in the great majority of wire wheels for automobiles. It was held that the patent is infringed by the type of lacing employed in the Frayer wheel made for the Phelps Mfg. Co.

Industry to Urge Tax Modification

Would Abolish Federal Tax on Trucks and Lower Passenger Car Rate

WASHINGTON, Oct. 25—Important legislative measures directly affecting the automotive industry will be brought to the attention of Congress immediately after the formal convening in December. It is expected that many proposed bills will be disposed of before the session automatically expires March 4, and the incoming Congress, with an altered political complexion, meets.

The question of taxation will have early attention because the public revenues for the fiscal year depend on this legislation. It is understood that spokesmen for the industry will urge the elimination of Federal taxes on motor trucks on the contention that motor truck transportation has become a distinct transportation unit and entitled to such consideration in legislation.

In pushing a program of tax revision an effort will be made to obtain a lower rate on passenger cars on similar grounds. It will be argued that this legislative relief would contribute to the restoration of confidence and revive business when the readjustment of prices is completed.

Both the National Automobile Chamber of Commerce and the American Automobile Association will endeavor to advance hearings on the Pittman-Sweet bill, providing for uniform registration of motor vehicles. The growing agitation against state restrictions is expected to influence legislators sufficiently to insure its passage.

Local motor clubs throughout the country have indorsed this measure thus giving it a national appeal. The controversy between the District of Columbia and Maryland as to licenses, headlight laws and registrations has also involved many congressmen who own or use motor cars. Their experiences with the authorities has brought the subject of national registration laws sharply to mind.

The Townsend highway bill will again be on the calendar.

Tariff to Get Airing

Manufacturers contemplating an expansion of export trade will probably give active support to plans for a lower tariff which will not, however, interrupt home production and distribution. In this connection there will be proposals for legislative action which will bring more harmonious reciprocal trade relations.

Representatives of the industry have expressed a desire to indorse large appropriations for the Bureau of Standards, Bureau of Mines, Bureau of Public Roads and other branches of the government which has to do with research and economic problems of the automobile business.

Waukesha Motors Gets $5,000,000 Order

Will Take Two Years to Complete —Company to Expand Facilities

WAUKESHA, WIS., Oct. 25—The Waukesha Motor Co., one of the largest manufacturers of truck and tractor motors exclusively in this country, has closed a contract with important truck interests under which it will furnish engines valued at $5,000,000, with contingent orders amounting to $10,000,000 additional. It is the biggest order the Waukesha company has ever booked. It is nearly twice as large as the contract received from the government two years ago, and will mean a total business volume of $10,000,000 during 1921.

The name of the purchaser of the motors is not given out, but it is intimated that it is the International. The first part of the order calls for 10,000 engines and will require about two years to fill.

"In order to carry out this contract," said S. A. Perkins, president of the Waukesha company, "new equipment and larger inventories of material will have to be effected. To provide for this and take care of the steadily growing business, we are making an issue of 8 per cent preferred stock, which will be absorbed locally, continuing a local ownership and control."

The Waukesha Motor Co. was founded in 1910 and that year its business amounted to $20,000. In 1920 the volume reaches $5,000,000. The payroll has grown in the decade from $500 per month to more than $100,000 a month, and the floor space from 3000 sq. ft. to in excess of 210,000 sq. ft.

Harry L. Horning, vice-president and chief engineer, returned late last week from an extended trip and confirmed the report that the order has been closed.

Money Shortage Causes Texas Receivership

FORT WORTH, TEXAS, Oct. 25—George W. Polk, attorney, and T. B. Lister, chief accountant, have been appointed receivers for the Texas Motor Car Assn. by District Judge Roy upon application of officers and trustees of the company. The receivers were asked for on Oct. 21 to conserve assets and protect the stockholders, according to President Vernor. Assets are $2,000,000 and liabilities, $300,000.

Inability to realize on the assets and to borrow money were given by the petition as reasons for the receivership. The company has on hand 100 unfinished cars, a large quantity of material and $500,000 worth of parts, as well as $250,000 worth of tires. The plant is operating under direction of the receivers.

The company makes the Texan car and truck.

KENTUCKY AWARDED $800,000 FOR ROADS

LOUISVILLE, Oct. 23 — Secretary Meredith, of the Department of Agriculture, announced to-day that he has authorized the granting of Federal aid to the extent of over $800,000 for road building in Kentucky. These awards are the largest made this fiscal year to any State. With the State matching this appropriation an expenditure of over $1,600,000 will be made on Kentucky roads in the coming year.

Pierce Earnings Drop in September Quarter

NEW YORK, Oct. 28—The Pierce-Arrow Motor Car Co. for the three months ended Sept. 30 reports a surplus, after charges and Federal taxes, of $355,310, or the equivalent after preferred dividends of 62 cents a share on the common stock. In the preceding quarter the earnings were $705,779, or $2.02 a share. For the September quarter of last year the earnings were $476,852, or $1.10 a share.

The surplus for the nine months of this year amounts to $1,778,354, or $4.71 a share on the common stock, after providing for the preferred. For the same period of 1919 the balance of four dividends amounted to $1,670,540, or $4.28 a share for the common. The estimated Federal taxes for the nine months of this year, together with interest charges, amount to $1,468,672, compared with $994,206 in 1919.

TABULATE STOCK PAYMENTS

NEW YORK, Oct. 28—A meeting of the various committees representing the Maxwell and Chalmers companies will be held late to-day to tabulate the first payments of 10 per cent on the proposed new stock issue by stockholders who have deposited their old securities with the committees. The response has been satisfactory and there is said to be no doubt the reorganization plan will go through. No figures will be available, however, until the tabulation has been completed.

R. & V. ENGINE UNIT RE-OPENS

MOLINE, ILL., Oct. 25—Plant No. 2 of the Root & Van Dervoort Eng. Co., manufacturers of engines for automobiles, at Moline, Ill., has been re-opened after a month's suspension, due to a falling off in orders from motor vehicle manufacturers. Production has been ahead of demand and a suspension became imperative.

PAGE SUBSIDIARY LIQUIDATES

NEW YORK, Oct. 22—Information has reached this city that the Handley-Page South African Transportation Co., Ltd., has been granted a court order providing for the liquidation of its affairs. The company was formed in January, 1919, with a capital of $500,000 to establish aerial transportation lines.

President in Favor of Aircraft Study

Letter Tells of Importance of Representation at Standards Meeting in Paris

WASHINGTON, Oct. 22—The text of President Wilson's letter to Prof. J. S. Ames, authorizing American participation in the plenary conferences of the International Aircraft Standards Commission, was given out at the White House to-day. The letter shows that the President is in sympathy with movements to advance scientific research, particularly in the development of aeronautics.

The letter reads in full:

"The failure of the bill introduced into the Congress to authorize official American participation in the plenary meeting of the International Aircraft Standards Commission in Paris in November of course makes it impossible for us to select delegates who can have a status which would have been possible had that measure passed. It seems to me, however, important that there should be American representation at the conference, and I would be glad if the National Advisory Committee for Aeronautics could arrange to have Americans present, representing the National Advisory Committee and, unofficially, America. I understand that the international conference will have no power to make any engagements or commitments, but will merely suggest standards for recommendation to the appropriate authorities of the several countries. If you could select and secure the presence of delegates who could bring back the recommendations and debates at the conference, I have no doubt their report will be very helpful to the appropriate committees of the Congress and to those executive officers who deal with such matters."

It was also announced that Commander Arthur K. Atkins, the Navy Department representative on the American commission, would probably be chairman.

S. A. E. TO DISCUSS FUELIZER

DETROIT, Oct. 25—The Detroit Section of the Society of Automotive Engineers will discuss the Packard fuelizer at its meeting to be held Oct. 29. The paper will be given by L. M. Woolson, experimental engineer of the Packard Motor Car Co. The meeting will be held at the Board of Commerce.

TURNER HOLDS UP NEW PLANT

PORT WASHINGTON, WIS., Oct. 23—The Turner Mfg. Co., manufacturer of tractors and gas engines, has deferred until the spring of 1921 the construction of a series of plant additions, due to existing conditions. Plans have been prepared and contracts awarded to Frank D. Chase & Co., Inc., Chicago, which will be held in abeyance for the time being.

Germans Attempt U. S. Penetration

Larsen Machines Failure Because of Defective Feed—Differ on All-Metal Planes

(*Continued from page* 892)

of the rigid tests which are required of American manufacturers before aircraft are accepted. They were put into service at once by the Post Office Department and a few days later came the tragedy which cost Pilot Max Miller and his mechanician their lives. Soon afterward two other mail pilots were killed.

The disastrous attempts of the Post Office Department to use these machines resulted in a storm of protest all over the country and did more than anything which has happened thus far to give a black eye to the airmail service.

A report made by the Postoffice Department of its investigation of these accidents says that they were due principally to a defective gasoline feed system and adds:

"There is no truth in the statement attributed to Larsen that the accidents to these machines were due to lack of ordinary care on the part of the Post Office Department employees. The accidents were, on the contrary, directly attributable to the defects pointed out."

Development of all-metal planes has progressed further in Germany than in any other country. This is due to the fact that the Germans were forced to use metal in the closing months of the war because they had no other materials. Persistent attempts to develop metal machines have been made in England, France and Italy, but they have not passed the experimental stage. Similar experiments are under way in the United States, especially under the direction of the Army Air Service, but there is a wide and honest difference of opinion among American manufacturers and among European for that matter as to whether the ideal aircraft of the future will be an all-metal machine.

Regret Official Acceptance

For this reason American aircraft interests view with regret the apparent acceptance by the Army and Navy and Post Office Department, without what they consider adequate tests, of the German assertion that the J L 6, a Junker plane, sold by Larsen, was the crowning achievement of aviation. Larsen has returned to Europe and for that reason it has not been possible to obtain from him a statement on the assertion freely made here, that he is an agent of the Junker company and was not handling the machines he sold on his own responsibility.

While the Zeppelin activities were under way and the Junker propaganda in full swing, Dr. Schutte, president of the Schutte-Lanz Co., the only other rigid aircraft constructors in Germany, also was busy in this country.

PATCHES KEEP DOWN DEMAND FOR TIRES

AKRON, Oct. 26—Manufacturers here have learned that one important factor in keeping down the demand for automobile tires is the steadily increasing number of motorists who are taking their tires to repair shops in all parts of the country. Companies making repair shop supplies report a good business and the repair men, generally speaking, are doing more vulcanizing now than they did when the factories were maintaining capacity production. There probably are more patched tires in motion to-day than ever before because of the increased economy of the average motorist.

Bethlehem Gets Funds for Continued Work

NEW YORK, Oct. 26—Committees representing the bank and merchandise creditors have agreed upon a program for the continued operation of the plants of the Bethlehem Motors Corp. under receivership through November and into December. This plan calls for the completion of 55 trucks in addition to those provided for in the September-October program. Authorization has been given for the issuance of $200,000 in receiver's certificates which will be taken at 99 by the banks having claims against the company. More than $150,000 worth of these certificates already have been subscribed by the banks, in proportion to the size of their claims. The receiver believes the funds thus obtained will carry the company until Jan. 1.

Orders for trucks continue to come in, especially from the foreign field, and the outlook for the company is more encouraging than it was a month ago. There now is talk of reorganization. Stockholders would be expected to take the initiative in such a movement but there is reason to believe the banks, which already are involved to the extent of $1,700,000, would be willing to co-operate.

Sopwith Seeks Buyer, Finances Badly Hit

LONDON, Oct. 8 (*Special Correspondence*)—Much comment has been aroused in investing circles by the unsatisfactory state of affairs disclosed at the creditors' meeting of the Sopwith Aviation and Engineering Co. (Inc.) of London. In 1913 the company had a capital of £26,000 ($130,000) and like most companies did well during the war.

It had a reserve fund exceeding £900,000 when it started to build the A. B. C. motorcycle about a year since, and had paid as much as £450,000 to the State Treasury as excess profits. It is now "on the rocks," but there is hope that the business will be disposed of satisfactorily.

METAL MARKETS

ALTHOUGH the pace at which demobilization of war prices in the iron and steel markets proceeds is rather slow when compared with the declines in the metal market's non-ferrous division, the all-important fact is that values continue to come down—slowly, perhaps, but nevertheless decidedly. Even coke has given way to this general retrograde movement. Even so, however, coke is still selling at seven to eight times its pre-war price level, and until this carbuncle is lanced pig iron values must not be looked for to decline much further without jeopardizing continuity of production. So long as it takes around $17 worth of coke to produce a ton of pig iron, the threat of some blast furnace proprietors that they will blow out their furnaces rather than compete in the present market must be accorded consideration, not as a bluff, but as the natural argument of one standing between the upper grindstone of high prices for raw material and declining prices for his finished product. The $40 market of which many speak these days was made by resales of iron that cost the consumers who turned sellers around $35. Until coke declines further, it is doubtful if any valley interest will want to book new business at the $40 level. Judge Gary's address at the meeting of the American Iron and Steel Institute corroborates what has been iterated and reiterated in these market reports time and again, namely, that the independents' quotations would have to come down to the United States Steel Corp. levels and that the latter would constitute the market until a more impressive buying movement than that now in sight materializes. Makers of alloy steels and other steel products entering chiefly into automotive construction who were in attendance at the Institute meeting admitted frankly that their books, for the time being, were bare of automotive orders, or nearly so, but that, from their conferences with leading automotive purchasing agents, they had absolute confidence in an early revival of demand from that quarter.

Pig Iron—Automotive foundries continue to be sellers rather than buyers. If it is true that some of these have sold No. 2 foundry iron at as low as $40, valley, cost of early replacement was not taken into consideration. Strictly first-class machinery cast scrap continues to sell at very close to $40 to general industrial foundries. The whole situation is wrapped up in the coke and coal markets.

Steel—Cold rolled strip steel shows further softening as the result of lack of demand from automotive buyers and is now quoted at around 8c., with hot rolled strip nominally called 6c. In the sheet market the deadlock continues. Those makers who were not amenable to requests for downward revision of contract prices, received cancellations, followed by requests for new quotations on the tonnages cancelled. Others have received suspensions of orders. There is more ways than one of killing a cat. Meanwhile finished steel is beginning to pile up in mill yards.

Copper—When the market touched levels close to 15c., conservative interests turned buyers, thus giving expression to their belief that bottom had been reached.

Aluminum—Imported sheets are offered at sacrifice prices on a c. i. f. New York basis, the purchaser to pay duty. Many of the foreign aluminum shipments are to banks which urge the actual buyers to liquidate their holdings with as little banking assistance as possible. Consuming demand for aluminum is in abeyance.

FINANCIAL NOTES

International Harvester Co. reports business at this time 25 per cent lower than a year ago, which showing the management regards as about on par with general business. No particular reduction has been made in working forces and prices remain unchanged for the present.

Dixie Rubber Co.—Stockholders of the company have filed a petition in chancery court asking that the clerk and master be named receivers for the corporation and petitioning the court to take charge of the affairs of the corporation. The company is located in Memphis, Tenn.

Trailmobile Co., Cincinnati, has been authorized to increase its capitalization from $680,000 to $1,500,000, the increase to be used to provide for the purchase of real estate on which the company's new plant at Oakley is located and to provide for business development.

Detroit Toledo & Ironton Railroad reports gross earnings of $3,068,361 for the eight months ending Aug. 31, compared with $2,378,809 for the same period a year ago. The net operating deficit for the period was $836,871 compared with $461,336 last year.

Hamilton Tire & Rubber Co., of Detroit, declared a cash dividend of 6 per cent on all stock of record on the date of the annual meeting last week. The company manufactures "Strongtread" tires and makes a specialty of supplying fleet owners.

Marathon Tire & Rubber Co., Cuyahoga Falls, adjoining Akron, will reduce the par on its capital stock from $100 to $10 a share. Calling in the old stock has resulted in a drop in value on the local exchange from $40 to $4.50 a share.

Russell Motor Car Co. reports net profits for the year ended July 31, 1920, as $339,453, a decrease under the year previous of $118,425. Despite this decrease, President Lloyd Harris regards the outlook as hopeful.

Swinehart Tire & Rubber Co.—Though directors have deferred payment of dividend on the common stock, they have declared the regular quarterly dividend on the preferred, which is payable Dec. 15.

Hanson Motor Co. has been granted permission to increase its capital stock from $1,500,000 to $2,500,000. The stock is being offered at $125 per share, which is $25 above par.

Brock (A. S.) Rubber Co.—A petition in bankruptcy has been filed against the company by three creditors whose claims aggregate $26,548.

Lee Rubber & Tire Corp. has declared a quarterly dividend of fifty cents a share on the capital stock payable Dec. 1.

Eisemann Magneto Corp. will pay a regular quarterly dividend of $1.75 a share on the preferred stock on Nov. 1.

Hood Rubber Co., declared a quarterly dividend payable Nov. 1, of 1¾ per cent.

Lincoln Motor Defers October Dividend

DETROIT, Oct. 22—President H. M. Leland of Lincoln Motor Co., declared to-day the regular quarterly dividend on Class A stock due this month would be deferred because of the prevailing financial stringency. In the announcement Leland said the company was producing the new Lincoln on a quantity basis, was receiving no cancellations and declared shipping orders would absorb the production for several weeks.

In passing the dividend Leland said: "In view of world-wide conditions facing the industry and the necessity for retaining maximum cash resources the directors have decided it is wise to defer the October dividend and retain it in the surplus. It is expected confidently that payments, which are cumulative, will be resumed upon a return of conditions to normal." Lincoln stock dropped five points to-day as result of announcement, closing around 34.

Sinclair Creditors Compel Receivership

SPRINGFIELD, MASS., Oct. 26—The Sinclair Motors Corp. has been thrown into receivership in Federal Court to avert bankruptcy proceedings. The action was taken after three creditors with claims aggregating $20,000 had filed an involuntary petition in bankruptcy. Federal Judge Morton was asked by the executive committee of creditors, which has been managing the affairs of the company for several weeks, to name receivers and he granted the request. To serve in this capacity he appointed George Bausman, a member of the committee representing bank creditors, and J. L. Doherty, a Springfield lawyer. The proceedings to have the company declared insolvent were taken by creditors who were not content to await the result of efforts by the creditors' committee to straighten out the company's affairs.

All operations at the plant have been suspended and the affairs of the company will be liquidated. None of the stockholders can afford to make a further investment in the enterprise. The committee had hoped to sell the motorcycle end of the business as a going concern and the Government was anxious to have the company complete a truck contract, but it is now unwilling to deal with a company which is in receivership.

KELSEY WHEEL CUTS FORCE

WINDSOR, ONT., Oct. 23—Slackened buying in the automobile industry caused officials of the Kelsey Wheel Co. to lay off half the working force at the Border Cities plant. M. G. Campbell of the company stated that he expected business would be quiet for two or three months. An official of the Canadian Commercial Body Co. stated that business had fallen off considerably. On account of the difficulty of getting men skilled in body work, the company is following the plan of accumulating a reserve stock in case demand does not fully take care of output.

TO CONNECT MICHIGAN ROADS

GRAND RAPIDS, MICH., Oct. 22—Kent County will begin immediately the construction of new concrete roads to connect trunk line highways, the total cost of which will be $378,800. The county's portion will be $94,700 which was authorized by commissioners this week. The remainder of the money will come from the State road fund.

Bank Credits

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Oct. 28—Exports in September were valued at $606,000,000, or $28,000,000 more than in August and $11,000,000 more than in September, 1919. Imports in September, $363,000,000, the lowest value for any month of the present year, were less by $150,000,000 than in August and $72,000,000 less than in September, 1919. The excess of exports over imports, $243,000,000, was surpassed this year only in January, March and May. For the nine months of this year exports were value at $6,082,000,000, or $215,000,000 more than in the corresponding period of 1919. The value of imports for the nine months of 1920, $4,358,000,000, was $1,661,000,000 greater than for the corresponding period of 1919. The excess of exports for the nine months of this year was $1,724,000,000, as compared with an export balance of $3,170,000,000 for the corresponding period of last year.

Local call money rates ranged from 6 per cent to 10 per cent last week, the latter rate also being the closing rate on Monday of this week. The same range of rates obtained week before last.

The combined statement of the associated institutions of the New York Clearing House showed a decline last week of $112,935,000 in net demand deposits; but despite a reduction of $90,843,000 in the loan and discount item, the reserves fell to an amount $23,977,180 below the prescribed requirements. A week earlier the excess reserves totaled $26,256,020. The actual decline in reserves, accordingly, was $50,233,200.

The New York Federal Reserve Bank, on the other hand, showed on Friday a ratio of reserves to total note and deposit liabilities only one-tenth of a point below that of a week earlier. Through the transfer of $25,000,000 of rediscounts to other Federal Reserve Banks, the decline in reserves had been kept almost exactly proportionate to the decline in deposits and note circulation.

The Federal Reserve Banks as a whole recorded an improvement in their reserve position. In total reserves there was an actual gain of $2,359,000, accompanied by a reduction of $43,442,000 in discounted bills on hand. Net deposits declined $69,653,000, while Federal Reserve notes in circulation increased $2,928,000 to a total of $3,356,000,000, a record amount. The ratio of gold reserves to Federal Reserve notes in circulation, after setting aside 35 per cent against net deposits, increased from 46.6 per cent a week earlier to 47.3 per cent.

MIDLAND SUPPLY BANKRUPT

NEW YORK, Oct. 27—The Midland Accessory & Supply Co., Inc., has filed schedules in bankruptcy with liabilities of $43,549 and assets of $13,393. The Commercial Trust Co. of America is a secured creditor for $3,500.

INDUSTRIAL NOTES

Killen Chemical Co., Ltd., which recently took over the business of the Aksala Chemical Co. of Chicago, has been reorganized and has instituted plans for additions and expansions. Officers of the consolidated company are D. J. Killen, president; J. F. Murphy, vice-president, and R. W. Johnston, secretary-treasurer. The company also operates a plant at Marinette, Wis.

Triumph Motors Corp., Medina, N. Y., has purchased the Goodsell and Rogers properties and several smaller tracts and will shortly begin the erection of a factory for building of motor trucks. Henry Weigen, treasurer and general superintendent of the company, in a statement said that the first building would be completed and production begun probably before the end of this year.

Landall Farm Tractor Co. has been incorporated at Carey, Ohio, with a capital of $500,000 to deal in farm tractors and power farming machinery both in the United States and in foreign countries. The incorporators are F. S. Huston, H. F. Graves, R. M. Lucky, J. D. Eming, C. A. Carpenter and W. R. Kurtz.

Hadley Bros.-Uhl Co., St. Louis, manufacturers of patches and cements for tires, has been incorporated under the laws of Missouri, for $50,000. The officers of the company are S. W. Uhl, president; H. L. Hadley, vice-president, and F. K. Hadley, secretary and treasurer.

Dort Motor Car Co., body plant, Kalamazoo, formerly the Lull Carriage Co. factory, has been put in operation, employing about 75 men. The plant has been remodeled and equipped with the most modern machinery for body construction. William Henderson is manager.

Hollis Tractor Co., Pittsburgh, is having plans drawn for two new buildings and for remodeling existing buildings on the tract bought by the company. The remodeled buildings are expected to be ready for occupancy this fall and the new buildings in the spring.

Warren Machine Products Co., formerly known as the Jacobson Machine Mfg. Co., Warren, Pa., has suspended operations indefinitely for lack of orders. The company was manufacturing parts for the automotive industry.

Standard Top Co. has started construction of a one-story brick factory, 40 x 90 feet. The cost of the building will be approximately $15,000. The company will take possession in the near future.

Antigo Foundry Co., Antigo, Wis., has been organized and will establish a gray iron shop in the former plant of the International Hoist Co. Principal owners are A. L. Hyams and C. J. Nelson.

New Era Spring & Specialty Co., Grand Rapids, Mich., has given the Richards-Wilcox Canadian Co., London, Ont., the sole license to manufacture its bumpers in Canada.

Morse Chain Co., Ithaca, N. Y., has opened a Detroit plant, which will be devoted entirely to the manufacture of chain sprockets and the Morse adjustment.

AMERICAN BODY ORGANIZED

GREEN BAY, WIS., Oct. 25—The American Automobile Body Co. has been organized by John Perry and Earl and Willard Fraser, all of Appleton, Wis., and is equipping the old Key Calk Horseshoe Co. plant, which will provide an initial capacity of ten bodies a day. The factory was to have been established in Appleton, but Green Bay interests induced a change of location, as Appleton has three body plants while Green Bay, with a large motor truck plant, had none. The Fraser brothers are prominent in the lumber manufacturing industry in northern Wisconsin.

Connecticut Factories Readjust Work Basis

HARTFORD, CONN., Oct. 23—Industrial readjustment is in process in this State, and promises to become general. At present it affects principally the large manufacturing companies whose products are allied with those of the automobile industry. Concerns making rubber tires, cotton duck for tires, ball bearings and various motor vehicle accessories are curtailing, as a rule, and in a few instances have shut down altogether.

The Hartford plant of the United States Rubber Company, which has been employing about 3000 hands all summer, has reduced this force lately to about 1000, and are working on a slightly shorter schedule than normal.

The Standard Steel & Bearings, Inc., of Plainville, which recently laid off two shifts of help, retaining one shift, has closed its plant for an indefinite period. The Fafnir Bearing Co., manufacturing ball bearings in a large plant in New Britain, has announced that it will reduce its working hours to 45 a week. It has been running 55 hours.

From Meriden comes the report from the Connecticut Telephone and Electric Co. that there is "absolutely nothing" to the report that it was to shut down for a period.

Construction Started on New Wildman Rubber

BAY CITY, MICH., Oct. 22—Mayor R. V. Munday turned the first shovelful of earth for the plant of the Wildman Rubber Co. here in the presence of city officials and hundreds of citizens, following action by the city council vacating Morton Avenue which runs through the plant site. Work on the building construction will be pushed rapidly in the hope of getting work started on the steel and masonry construction before winter begins.

Erection of the first unit of the plant will involve an outlay of approximately $1,000,000, the company announcing its intention of installing the most approved machinery for the manufacture of tires and tubes. It is planned to start production in the new plant late in 1921.

JEFFERSON NAMES OFFICERS

JEFFERSON, WIS., Oct. 25—The Jefferson Rubber Co., organized here with $300,000 capital, has perfected its organization by the election of these officers: President, R. W. Lyons, Chicago; vice-president, C. R. Girton, Chicago; treasurer, Will S. Henry, Jefferson; secretary, William E. Taube, Chicago.

MEN OF THE INDUSTRY

Konrad Schreier, secretary and treasurer of the Falls Motors Corp., Sheboygan Falls, Wis., has resigned, effective Nov. 1, to devote his entire time to extensive interests centered in Chicago. Schreier became secretary-treasurer about three years ago, when the Falls company passed into new ownership and control and was expanded to handle war contracts.

C. J. Strobel has been named superintendent of the Marysville plant of the Athol Mfg. Co., which will operate as a branch of the Massachusetts factory. T. G. Ralph, chief engineer; E. B. McGrew, production manager, and Leslie Moulton, office manager also have been named.

Guy R. Chrysler, formerly vice-president and sales manager of the Gramm-Bernstein Sales Corp., has been appointed retail sales manager of the Rainier Motor Corp., manufacturers of worm-drive trucks. Chrysler is one of the pioneer truck salesmen.

A. Conro Fiero, formerly European sales manager of the Buda Co. of Chicago, is now associated with the foreign department of the White Co., and will sail Nov. 15 for West and South Africa to make a survey of the transportation possibilities for motor trucks.

E. C. Bernhard has been placed in charge of manufacturing at the plants of the L. H. Gilmer Co., manufacturers of belting and automotive products, Philadelphia. He has been with S. K. F. Industries for the past seven years.

Lucien L. King, advertising manager of Goodyear Tire & Rubber Co., is expected back from Europe this week, following a five months' trip, on which he has made a survey of foreign markets and business conditions.

Clint McDade has been appointed advertising manager of the Keystone Oil & Mfg. Co. of Chicago. He was formerly with the Jenkins Vulcan Spring Co. and the Elgin Motor Car Corp.

H. G. Zimmerman, assistant general manager of the General Motors Export Corp., has sailed for England on a six weeks trip on which he will visit the Olympia show in London.

I. C. Monroe, for the past seven years head of the inspection division at Goodyear, has been made assistant superintendent of Mason Tire & Rubber Co., succeeding J. H. McGachan.

Roy Davey, who at the request of the receiver, returned to his old post as general sales manager of the Bethlehem Motors Corp., has withdrawn from that organization.

S. B. Robertson has been appointed director of engineering at the B. F. Goodrich Co., succeeding George Perks, resigned.

SERVICE APPOINTMENTS MADE

NEW YORK, Oct. 25 — President Charles Clifton of the National Automobile Chamber of Commerce has made appointments on the Service Committee to fill places made vacant by resignations due to changed positions or pressure of other work. A. B. Cumner of Autocar has been made chairman of the committee, taking the place of E. T. Herbig. New members on the committee are F. A. Bonham (Chevrolet), F. Van Z. Lane (Hare's Motors), J. B. Bray (Grant), F. J. Wells (Pierce-Arrow), L. C. Voyles (Marmon), and C. R. Lester (Packard), are retained on the committee.

Calendar

SHOWS

Nov. 14-21—New York, Automobile Salon, Commodore Hotel Ballroom.

Nov. 15-20—Chicago, Automotive Equipment Show, Coliseum, Automotive Equipment Association.

Dec. 10-18—New York. Motor Boat Show. Grand Central Palace.

Jan. 3-8 — New York, Motor Truck Show. Motor Truck Ass'n of America, Twelfth Regiment Armory.

Jan. 8-15—New York. National Passenger Car Show, Grand Central Palace. Auspices of N.A.C.C.

Jan. 14-21—Milwaukee. Annual Automobile Show, Milwaukee Automobile Dealers' Ass'n.

Jan. 22-29—Cleveland, Annual Passenger Car Show, Cleveland Mfr's & Dealers' Ass'n, Wigmore Coliseum.

Jan. 22-29—Montreal, Annual Automobile Show, Montreal Automobile Trade Ass'n, Motordrome Bldg.

Jan. 29-Feb. 4 — Chicago, National Passenger Car Show, Coliseum, Auspices of N.A.C.C.

Feb. 5-12—Minneapolis, Annual Automobile Show, Minneapolis Automobile Trade Ass'n.

Feb. 6-12—Columbus, National Tractor Show, Columbus Tractor & Implement Club, Ohio State Fair Grounds.

Feb. 12-19—Kansas City. Annual Automobile Show, Kansas City Motor Car Dealers' Ass'n.

Mar. 12-19—Boston, Annual Automobile Show, Mechanics Bldg. and South Armory.

FOREIGN SHOWS

Nov. 4-13—London, International Motor Exhibition, Society Motor Mfr's and Traders, Ltd., Olympia and White City.

Nov. 6-13—Christchurch, N. Z., Olympia Motors Exhibition.

Nov. 29-Dec. 4—London, Cycle and Motorcycle Show, Cycle and Motorcycle Mfr's and Traders Union, Ltd., Olympia.

Jan. 7 — Sydney, Australian Motor Show.

Jan. 22-29 — Colombo, Ceylon Motor Show.

Feb. 7—Delhi, India, Delhi Motor Show.

CONVENTIONS

Nov. 9-11 — Cleveland, Service Managers' Convention, National Automobile Chamber of Commerce.

Nov. 30-Dec. 3—St. Louis, Third Annual Meeting and Exhibition, Automobile Accessories Branch, National Hardware Ass'n.

Dec. 7-10—New York. Annual meeting American Society of Mechanical Engineers. Engineering Societies Building.

Dec. 8-9 — Cincinnati, Annual Convention, Ohio Automobile Jobbers' Association

Dec. 13—Washington, Convention of American Association of State Highway Officials.

Dec. 28-30 — Chicago, Annual Meeting American Society of Agricultural Engineers.

Jan. 11-13—S. A. E. Annual Meeting, New York City.

RACES AND TOURS

Nov. 25—Los Angeles, Thanksgiving Day Speedway Classic, Beverly Hills Speedway.

South Carolina Finds Cars Bring Revenue

COLUMBIA, S. C., Oct. 22—South Carolina has at present approximately $115,400,250 invested in automobiles and other motor vehicles, as compared with the combined investments of all banks in the State of $42,000,000, according to statistics compiled by the State Highway Commission. These figures are based upon an average cost per car of $1,275, which is considered reasonable by the department.

Figures from the department show that last year the combined capital invested in all industries in the State was slightly in excess of $201,000,000 or not quite double the amount invested in motor vehicles. South Carolina is strictly a rural State, there being no city in its borders with a population in excess of 60,000 people.

Registration of cars has also reached the highest total in the history of the State with 94,511 for the nine months of 1920. Last year the total registration was 74,299 and in 1918 the number was 58,803, while in 1917 the registration was 40,174 motor vehicles.

"This serves to give us some idea of the importance already assumed by automobiles," says the highway commission, "because of the money value alone which they reflect, and demonstrates most conclusively the need for a system of roads in this State good all the year round; a necessity that grows almost imperative if we stop to consider the enormous loss to the citizens of the State occasioned by roads such as we have enjoyed in the past."

TO CONFER ON CAR PLACINGS

NEW YORK, Oct. 23—The National Industrial Traffic League at its October meeting appointed a special committee to confer with carriers on defining and limiting the free placement of cars at factory sidings. In the form suggested by a committee of railroad traffic officials at the meeting this seems to contemplate extra charges on a considerable proportion of cars spotted.

The committee has approved an increase in demurrage rates, as follows: For a period of 6 months the rates to be on the basis of $3 per day for the first 4 days after free time; $6 per day for the next 3 days and $10 each succeeding day.

Goodyear Shop Plan Proves Popularity

AKRON, Oct. 22—The factory employees' representative system of management inaugurated a year ago at the plant of the Goodyear Tire & Rubber Co. is regarded as a success by the officials of that corporation, and it is claimed that the employees entitled to be registered as the "electorate" are interested in the plan, and these are furnishing or constitute the big support of the vast industrial organization.

The second "general election" of the Goodyear "republic" has just been held, approximately 9000 employees voting. Six of the present members of the Goodyear "senate" seeking re-election were defeated as were 23 members of the "house of representatives." More than 1000 women employees participated, and the factory heads declare that the result of the voting indicates clearly that the factory workers have an interest in the whole institution which augurs well for it and the representative system of factory management.

MICHIGAN INSURANCE STARTS

DETROIT, Oct. 23—The Michigan Automobile Insurance Co., capitalized at $250,000, with headquarters at Grand Rapids, will begin writing policies Nov. 1. Officers of the company have been elected as follows: H. S. Webber, president, Grand Rapids; B. F. Hall, Belding, first vice-president; H. J. Dudley, Grand Rapids, second vice-president; H. J. Kennedy, Grand Rapids, secretary-treasurer. The company will write all kinds of insurance on automobiles.

Lumber Truck Law Branded Discriminatory

SHREVEPORT, LA., Oct. 22—The Shreveport Automobile Dealers Association, through the law firm of Wise, Randolph, Randall & Freyer, has applied to the civil courts for an injunction restraining the State from enforcing a law passed by the 1920 Louisiana legislature, preventing the hauling of logs on trucks over model roads. Discussing this injunction suit, O. C. Cathey, president of the Shreveport dealers association, said:

"Not only are logs barred from the model roads, but the hauling of hewn or sawed timbers over any road in the State is also prevented. The only way logs or timbers can be hauled is by the obtaining of a permit from the police jury of each parish through which the road passes. This permit estimates the damage to be done to the road by the hauling of the logs and timbers, and then the man to whom the permit is issued must pay in cash that estimated damage, in advance, *whether or not any actual damage is done*. For instance, a man with a truck can haul 10,000 lb. of iron pipe over these roads without taking out a permit or paying any damages, either estimated or actual, but no lumberman can haul 10,000 lb. of logs or finished timbers over any of these roads without paying, and paying heavily, for it. We consider this class legislation."

LINE DRIVE CLAIMS PAID OFF

MILWAUKEE, Oct. 22—Creditors of the Line Drive Tractor Co., Inc., have received a second and final dividend of 34 per cent, making a total disbursement of 64 per cent in payment of claims. The company was made defendant in involuntary bankruptcy proceedings in August, 1918, and its liabilities were $14,805, while assets amounting to $5,012 were claimed. The concern engaged in the manufacture of a gas tractor driven with reins like a horse is guided.